Spotted Mackerel (2016)

Scomberomorus munroi

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STOCK STATUS OVERVIEW

Jurisdiction	Stock	Fisheries	Stock status	Indicators
Western Australia	Western Australia	N/A	Negligible	
Northern Territory, Queensland	Northern Australia	GOCIFFF, ONLF	Sustainable	Catch, effort, current and historical fishing pressure
Queensland, New South Wales	Eastern Australia	ECIFFF, OTLF	Sustainable	Biomass, catch and catch rate, fishery-dependent length and age frequency, estimates of total mortality rate

OTLF Ocean Trap and Line (NSW), ONLF Offshore Net and Line Fishery (NT), ECIFFF East Coast Inshore Fin Fish Fishery (QLD), GOCIFFF Gulf of Carpentaria Inshore Fin Fish Fishery (QLD), N/A Not Applicable (WA)

STOCK STRUCTURE

Spotted Mackerel occurs in continental shelf waters along Australia's western and northern coast and along the eastern coast, to central New South Wales[1,2]. In northern and western Australian waters the delineation of stocks is not clear. Results from an otolith microchemistry study indicate that fish from Gove and Joseph Bonaparte Gulf may belong to separate stocks[2]. Therefore, a Northern Australian biological stock and a Western Australian biological stock are assumed here. In Eastern Australian waters, Spotted Mackerel comprise a single stock (confirmed through genetic analysis, otolith microchemistry and tagging studies) that is genetically isolated from fish in the northern Arafura Sea[1,2].

Here, assessment of stock status is presented at the biological stock level—Western Australia, Northern Australia and Eastern Australia.

STOCK STATUS

Eastern Australia

Spotted Mackerel is commonly fished throughout its distribution along the east coast of Australia. Queensland and New South Wales both access the part of the

biological stock that occurs in their waters. Most of the fishery occurs in Queensland waters, with a smaller seasonal fishery in northern New South Wales waters[9] during late-summer–autumn. An assessment of this stock conducted in 2005 indicated that catches in 2002 were near, or above, the estimated maximum sustainable yield (MSY) and that the stock was at risk of being overfished[7]. Management measures introduced in Queensland since 2002 have substantially reduced that risk[4]. These measures included a limit on the commercial harvest, the prevention of fishing using ring nets, by-product possession limits for net fishers and a reduced recreational possession limit. As a result of these restrictions, the Queensland commercial net harvest has been stable, but low. In 2014–15, the Queensland commercial line harvest was 72 t, which is above the 10-year average of 60 t, but below the annual commercial catch limit of 140 t[4,5,10]. The number of active licences and days fished in 2014–15 was below the 10-year average[4]. The Queensland recreational harvest of Spotted Mackerel decreased between 2001 and 2013–14[5], reflecting in part the reduction in recreational line fishing effort between 2001 and 2011[11]. The NSW recreational harvest of Spotted Mackerel was similar during 2001 and 2013–14 at between 10 000 and 13 000 fish, estimated to weigh around 41 t[9,10]. In 2014–15, the best estimate of the combined harvest of the Eastern Australian biological stock is below the estimated MSY of 296 t[4,5,10]. As the most recent stock assessment was completed 10 years ago (using data up to 2002) and alternative indicators have been developed, a weight-of-evidence approach was used to determine the status of this biological stock.

Nominal catch per unit effort for the Queensland commercial line harvest has been higher than historic levels for the past 3 years[4]. Nominal catch rates in New South Wales have fluctuated, but show no overall trends over the past 20 years[9]. The minimum legal size in Queensland and New South Wales is set above the size at maturity for males and equal to the size at maturity for females, providing some protection of the spawning stock[6,8]. In Queensland, fishery-dependent monitoring of the recreational and commercial harvest shows relatively consistent length structures during the past 9 years[4]. Fishery-dependent monitoring indicates a range of ages, including older fish (4–7 year olds) are present in the harvest, with 2–5 year olds dominating the catch[4]. Estimates of total mortality rate, derived from the fishery-dependent age composition data, indicate fishing mortality was lower than natural mortality between 2007–08 and 2014–15[4]. These are positive indicators of a stable spawning biomass with continuing recruitment. The above evidence indicates that the biomass of the Eastern Australian biological stock is unlikely to be recruitment overfished and the current level of fishing pressure is unlikely to cause the Eastern Australian biological stock to become recruitment overfished.

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

Northern Australia

Spotted Mackerel is broadly distributed across northern Australia, with components of this biological stock occurring in both the Northern Territory and Queensland[1,2]. This stock has not been targeted historically by commercial fishers and only rarely targeted by recreational fishers in either jurisdiction[3–5]. Since 1988, commercial catches of Spotted Mackerel in the Northern Territory have been low, with a maximum catch in 1992 of 349 kg and 30 kg taken in 2015. In 2015, the recreational catch in the Northern Territory was less than 2 tonnes (t)[3]. The trend in Queensland's Gulf of Carpentaria (QGOC) waters is similar, with annual catches over the 27-year time series ranging from 0–370 kg

and less than 50 kg taken in 2014–15. Commercial effort in the QGOC for Spotted Mackerel has also been historically low (between one and three active licences) and in 2014–15, one licence reported a single day fished[4]. There is a recreational possession limit of five Spotted Mackerel in both Northern Territory and Queensland waters. The minimum legal size in Queensland waters is set above the size at maturity for males and equal to the size at maturity for females[6–8]. Assuming post-release survival is moderate, this would provide some protection of the spawning stock in the QGOC part of the biological stock[4,6,8]. The above evidence indicates that the biomass of the Northern Australian biological stock is unlikely to be recruitment overfished and 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 Northern Australian biological stock is classified as a **sustainable stock**.

Western Australia

Stock status for the Western Australian biological stock is reported as negligible due to low catches in this jurisdiction. In Western Australia, only the Western Australian Mackerel Managed Fishery is licenced to land mackerel species and in 2015 the catch of Spotted Mackerel was 8 kg. The Western Australian Mackerel Managed Fishery predominantly targets Spanish Mackerel with gear, and in locations, not conducive to catching Spotted Mackerel. In the past 10 years, the average total commercial catch from this biological stock was 186 kg.

BIOLOGY

Spotted Mackerel biology[1,2,4,7]

Species	Longevity / Maximum Size	Maturity (50 per cent)
Spotted Mackerel	8 years; 1 230 mm TL	Females: 1–2 years; 600 mm TL Males: 1–2 years; 520 mm TL

DISTRIBUTION

Distribution of reported commercial catch of Spotted Mackerel

TABLES

Commercial Catch Methods	New South Wales	Northern Territory	Queensland	Western Australia
Gillnet		✓	✓	
Hand Line, Hand Reel or Powered Reels	✓			
Line		✓	✓	
Pelagic Longline	✓			
Trolling	✓			
Unspecified				✓

Fishing methods				
	New South Wales	Northern Territory	Queensland	Western Australia
Commercial				
Gillnet		✓	✓	
Hand Line, Hand Reel or Powered Reels	✓			
Line			✓	
Pelagic Longline	✓			
Trolling	✓			
Unspecified				✓
Indigenous				

Hand Line, Hand Reel or Powered Reels	✓	✓	✓	
Recreational				
Hand Line, Hand Reel or Powered Reels	✓	✓	✓	
Spearfishing	✓		✓	

Management Methods			
	New South Wales	Northern Territory	Queensland
Commercial			
Fishery spatial closures	✓	✓	✓
Gear restrictions	✓	✓	✓
Limited entry	✓	✓	✓
Marine park closures	✓		✓
Size limit	✓		✓
Spatial zoning	✓		✓
Total allowable catch			✓
Vessel restrictions	✓		✓
Indigenous			
Bag limits	✓		
Gear restrictions	✓	✓	✓
Seasonal or spatial closures	✓		
Section 31 (1)(c1), Aboriginal cultural fishing authority	✓		
Size limit	✓		
Recreational			
Gear restrictions	✓	✓	✓
Licence	✓		
Marine park closures	✓		✓

Possession limit	✓	✓	✓
Size limit	✓		✓
Spatial zoning			✓

Active Vessels			
	New South Wales	**Northern Territory**	**Queensland**
	57 License in OTLF,	1 Vessel in ONLF,	168 License in ECIFFF, 1 License in GOCIFFF,

OTLF Ocean Trap and Line(NSW)

ONLF Offshore Net and Line Fishery(NT)

ECIFFF East Coast Inshore Fin Fish Fishery(QLD)

GOCIFFF Gulf of Carpentaria Inshore Fin Fish Fishery(QLD)

Catch				
	New South Wales	**Northern Territory**	**Queensland**	**Western Australia**
Commercial	16.3255t in OTLF,		83.44t in ECIFFF,	
Indigenous	Unknown	Unknown, but likely to be negligible.	Unknown	
Recreational	41 t (2013–14)	<2 t (2000 to 2010)	65 t (2013–14)	

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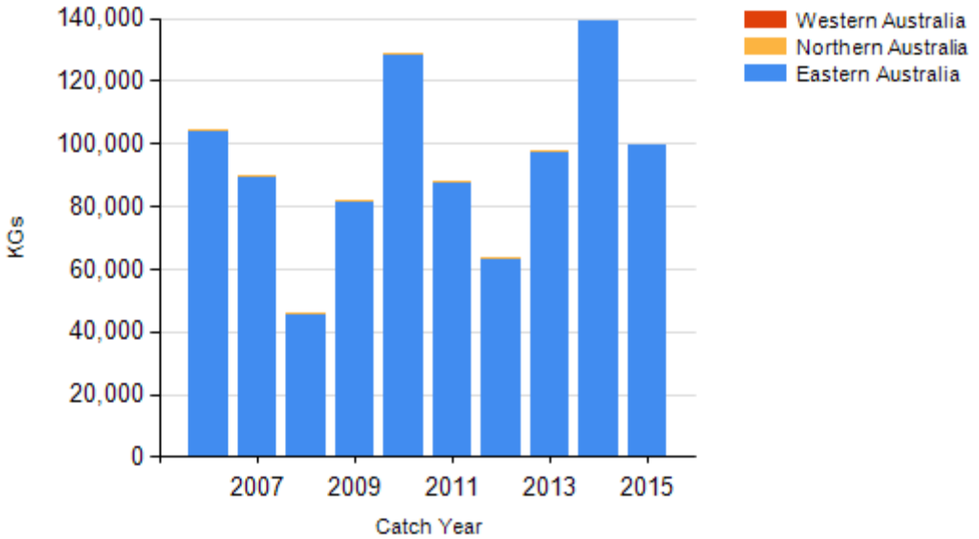
a Queensland - Indigenous In Queensland, under the Fisheries Act 1994, Indigenous fishers are able to use prescribed traditional and non-commercial fishing apparatus in waters open to fishing. Size and bag limits and seasonal closures do not apply to Indigenous fishers. Further exemptions to fishery regulations can be obtained through permits
b New South Wales - Indigenous Aboriginal Cultural Fishing Interim Access Arrangement allows an Aboriginal fisher in New South Wales to take in excess of a recreational bag limit in certain circumstances, for example, if they are doing so to provide fish to other community members who cannot harvest themselves.
c New South Wales - Indigenous Aboriginal cultural fishing authority - the authority that indigenous persons can apply for to take catches outside the recreational limits under the Fisheries Management Act 1994 (NSW), Section 37 (1)(c1), Aboriginal cultural fishing authority.

CATCH CHART



Commercial catch of Spotted Mackerel - note confidential catch not shown

EFFECTS OF FISHING ON THE MARINE ENVIRONMENT

- The majority of fishing for Spotted Mackerel uses trolled lines. This method has almost no impact on the habitats where it is used. Commercial coastal gillnets used in Queensland waters have minimal impact on the environment and are quite selective in their harvest[12]. In general, gillnet methods used by commercial fishers in nearshore waters result in minimal bycatch relative to the harvest of the target species. Mesh size regulations help to ensure that target species caught by these methods are within an appropriate size range. Commercial coastal gillnets are not used in New South Wales waters.
- Line-based fishing methods in nearshore waters can result in the capture and release of non-target species and undersized fish[5,10]. The rates of survival for released line caught Spotted Mackerel are unquantified and discard mortality could be substantial.
- Discarded fishing tackle from fishers poses a risk to seabirds and marine life, which can become entangled in or injured by discarded gear[13]. Programs to safely dispose of unwanted fishing tackle are in place in south-east Queensland and New South Wales[13].
- Commercial gillnets can occasionally interact with threatened, endangered and protected species. The impact on populations of these species is unquantified. In most jurisdictions, commercial fishers are required to report all interactions with protected species.

ENVIRONMENTAL EFFECTS on Spotted Mackerel

- Juvenile Spotted Mackerel are dependent on nearshore waters for survival and may be sensitive to declines in water quality resulting from land based influences[14]
- Spotted Mackerel prey on schooling baitfish. Climate change impacts on baitfish in Queensland waters are poorly understood[14].
- Changes in coastal currents and water temperatures associated with climate change have the potential to alter fish behaviour (for example, spawning activity and migration) and to affect the dispersal of eggs and larvae, which may influence the subsequent recruitment of Spotted Mackerel into fisheries[14–16].

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