

Mahi Mahi (2020)

Coryphaena hippurus



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STOCK STATUS OVERVIEW

Jurisdiction	Stock	Stock status	Indicators
Commonwealth, Queensland, New South Wales	Western and Central Pacific Ocean	Undefined	Catch
Commonwealth, Western Australia	Indian Ocean	Undefined	Catch

STOCK STRUCTURE

There are two species of Mahi Mahi in Australian waters; Common Mahi Mahi (*Coryphaena hippurus*) and Pompano Mahi Mahi (*Coryphaena equiselis*). Commercial and recreational catch is thought to be almost exclusively common Mahi Mahi and consequently it is the only species assessed here.

Mahi Mahi are a highly migratory tropical and subtropical species that straddle multiple domestic and international jurisdictions. Stock structure is not well resolved and for practical purposes, Mahi Mahi in the Indian Ocean and the Western and Central Pacific Ocean are considered to constitute two distinct management units which are managed by separate regional fisheries management organisations: the Indian Ocean Tuna Commission and the Western and Central Pacific Fisheries Commission. The boundaries of these units occur at the longitude of the Western Australia-Northern Territory border in northern Australia, and at the South Australia-Victoria border in southern Australia, reflecting the jurisdictional boundaries of these two RFMOs. The distribution of Mahi Mahi does not extend south of the Australian land mass.

Here, assessment of stock status is presented at the management unit level— Western and Central Pacific Ocean and Indian Ocean.

STOCK STATUS

Indian Ocean This cross-jurisdictional management unit has components in the Commonwealth, Western Australia and international and foreign waters. The

status presented here for the entire management unit has been established using evidence from all jurisdictions.

Total reported commercial catch for the Indian Ocean (FAO areas 51 and 57) has increased progressively from 2 700 t in the year 2000 to a peak of 17 000 t in 2018 [FAO 2020]. Most of this reported catch, and most of the increase, has come from the western Indian Ocean Pacific (FAO area 51, west of 80oE).

There are likely to be significant artisanal, and to a lesser extent recreational, landings of Mahi Mahi, particularly through the northern Indian Ocean rim and in south east Asia, that are not included in the estimates above. In addition, Mahi Mahi may be discarded in some fisheries, although discard mortality levels are unknown.

In the Indian Ocean, the majority of Mahi Mahi are thought to be taken using a variety of artisanal fishing methods (such as troll and gillnet). In the industrial fisheries, catches are taken by all the major sectors including gillnet (notably for Indian Ocean), longline, purse seine (particularly floating object sets) and pole-and-line.

For the Commonwealth part of the management unit, commercial landings are negligible and have fluctuated without trend under 2.1 t annually.

For the Western Australian part of the management unit, commercial and recreational landings are negligible with the stock generally not being subject to targeted fishing. The Western Australian commercial and charter catches from 2008–19 each averaged less than 0.2 t per annum. Mahi Mahi is not a major component of recreational landings, comprising less than 500 fish in the 2017–18 state-wide survey of boat based recreational fishing [Ryan et al. 2019].

Catches in South Australia are rare.

There has been no formal stock assessment of Mahi Mahi for the Indian Ocean area encompassing the Australian Fishing Zone. Benjamin and Karup [2012] undertook a virtual population analysis stock assessment using FiSAT that was confined to the southwest coast of India and used data to 2009. They estimated fishing mortality at 0.37 which, in the context of natural mortality assumed to be 1.0 [Aires-da-Silva et al. 2016] indicates a relatively light level of exploitation in that region at that time. Australian catches form a small component of the total international Indian Ocean catch and no other indicators of biomass level are available. There is therefore insufficient information available to confidently classify the status of this stock.

On the basis of the evidence provided above, the Indian Ocean management unit is classified as an **undefined stock**.

**Western
and Central
Pacific
Ocean**

This cross-jurisdictional management unit has components in the Commonwealth, New South Wales, Queensland, the Northern Territory and international and foreign waters. The status presented here for the entire management unit has been established using evidence from all jurisdictions.

Total reported commercial catch for the Western and Central Pacific Ocean (FAO areas 61, 71 and 81) peaked at over 30 000 tonnes (t) on a number of occasions during the 1980s and 1990s [FAO 2020]. Catch in 2018 was 22 180 t and has averaged 22 144 t over the most recent five years. Recent reported catches have been predominantly from the northwest Pacific (FAO area 61, north of 20[o]N) and the western central Pacific (FAO area 71, 20[o]N–25[o]S), with minor commercial catches reported in the southwest Pacific (FAO area 81, south of 25[o]S).

There are likely to be significant artisanal, and to a lesser extent recreational, landings of Mahi Mahi throughout south east Asia and Oceania that are not included in the estimates above. In addition, Mahi Mahi may be discarded in

some fisheries, although discard mortality levels are unknown.

For the Commonwealth part of the management unit, commercial landings over the period 2010 to 2019 peaked in 2011 at 345 t and have averaged 190 t over the most recent five years. Pelagic tuna longline is the primary gear used to catch this species.

For the New South Wales part of the management unit, commercial landings are relatively minor, at less than 10 t for 2019 and averaging 7.2 t over the last decade. The most recent recreational estimate was from a survey done in 2017–18 with an estimated 25 400 fish being harvested [Murphy et al. 2020].

Queensland annual commercial landings have averaged around 2.5 t over the previous decade [QFISH 2020] while approximately 75 t were harvested recreationally in 2013–14 [Webley et al. 2015].

For the Northern Territory part of the biological stock, landings have been very low (< 70 kg) and only relate to charter operators fishing offshore. The last catch of Mahi Mahi recorded in this jurisdiction was in 2015.

Catches in Victoria and Tasmania are rare.

In the western central Pacific, the majority of Mahi Mahi are taken using hook methods such as pelagic longline and troll, as well as significant bycatches by tuna purse seine fishing using fish aggregating devices (FADs).

There has been no formal stock assessment of Mahi Mahi for the western central Pacific. Gilman et al. [2013] undertook a sustainability overview of fisheries that supply Mahi Mahi in the western central Pacific and concluded that, overall, it was relatively “poorly managed” and “high risk” due to a lack of management and a lack of information on management and stock status. However, they concluded that there was a “medium risk” relating to current biomass and fishing mortality due to the highly productive life history characteristics of Mahi Mahi.

Campbell [2016] standardised Eastern Tuna and Billfish Fishery (ETBF) pelagic longline catch rates to develop an index of abundance for Mahi Mahi within the Australian area of operations. For the period 1998–2014 the abundance index showed moderately high year-to-year variability and little, if any, overall trend through this period. Campbell [2016] also examined time-series of Mahi Mahi size data and found strong seasonal changes in the mean weights of Mahi Mahi caught in the ETBF but no long term trend over the same period. Sporic et al. [2019] undertook ecological risk assessment of the ETBF and found Mahi Mahi to be a low risk species in the context of ETBF interactions and within its operating area.

However, Mahi Mahi are not highly targeted by the Australian commercial sector and Australian catches form a small component of the total international Pacific Ocean catch. There is therefore insufficient information available to confidently classify the status of this stock.

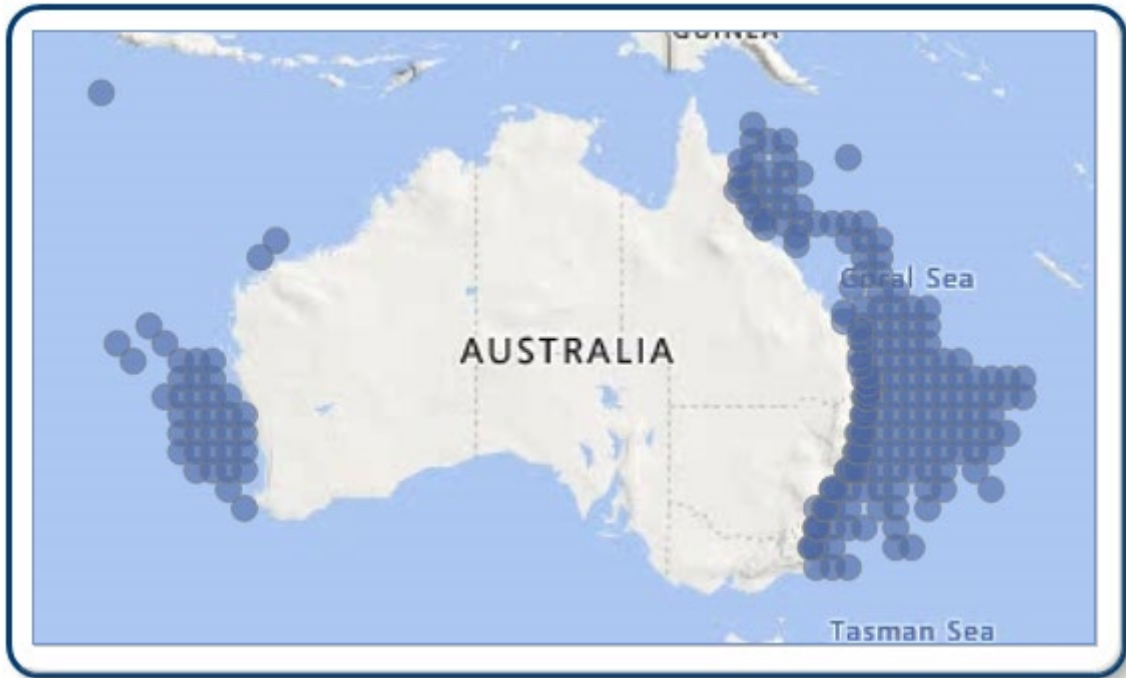
On the basis of the evidence provided above, the Western Central Pacific Ocean management unit is classified as an **undefined stock**.

BIOLOGY

Mahi Mahi biology [Uchiyama et al. 1986, Massuti and Morales-Nin 1997, Castro et al. 1999, Massuti and Morales-Nin 1999, Uchiyama and Boggs 2006]

Species	Longevity / Maximum Size	Maturity (50 per cent)
Mahi Mahi	4 years, > 1 490 mm	Females 550 mm FL Males 620 mm FL

DISTRIBUTION



Distribution of reported Australian commercial catch of Mahi Mahi

TABLES

Fishing methods	Commonwealth	New South Wales	Northern Territory	Queensland	Western Australia
Charter					
Hook and Line		✓	✓	✓	
Rod and reel					✓
Commercial					
Hand Line, Hand Reel or Powered Reels					✓
Line				✓	
Pelagic Longline	✓				
Trolling					✓
Various		✓			
Recreational					
Hook and Line		✓		✓	✓
Spearfishing		✓		✓	✓

Management Methods	Commonwealth	New South Wales	Northern Territory	Queensland	Western Australia
Charter					

Bag limits		✓			
Catch restrictions				✓	
Gear restrictions			✓		
Licence					✓
Limited entry		✓	✓		
Possession limit		✓	✓		✓
Size limit				✓	✓
Size limits		✓			
Spatial closures		✓	✓		✓
Commercial					
Area restrictions	✓				
Catch restrictions					✓
Gear restrictions	✓			✓	
Limited entry	✓			✓	✓
Size limit				✓	✓
Spatial closures					✓
Recreational					
Bag limits		✓			
Catch restrictions				✓	
Licence					✓
License		✓			
Possession limit		✓			✓
Size limit		✓		✓	✓
Spatial closures		✓			✓

Catch	Commonwealth	New South Wales	Northern Territory	Queensland	Western Australia
Charter					< 0.5 t
Commercial	147.738 t	5.2079 t		0.4579 t	0.049 t
Indigenous				Unknown	Unknown
Recreational		25,400 (numbers-2017/18)	Unknown	75t (2013/14)	Insufficient data

Western Australia – Recreational (Catch) Statewide survey of boat-based recreational fishing in Western Australia 2017–18 [Ryan et al. 2019]. Shore-based catch (if any) largely unknown.

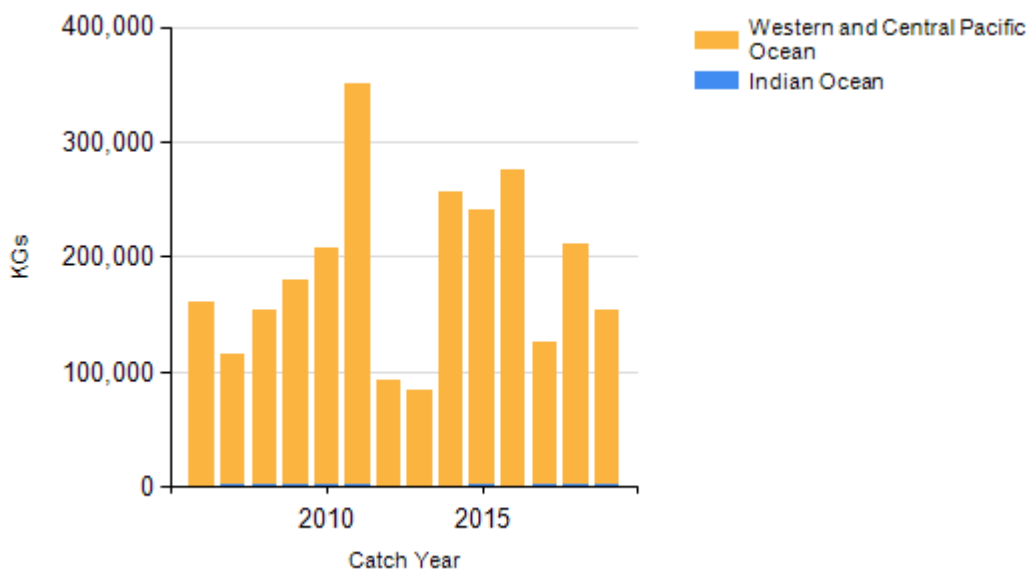
Western Australia – Recreational (Management methods) Boat-based recreational fishing licence required.

Western Australia – Charter (Catch) The charter catch is an estimate based on numbers of fish caught multiplied by an average weight.

Queensland – Indigenous (Management Methods) 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 bag limits and seasonal closures do not apply to Indigenous fishers. Further exemptions to fishery regulations can be obtained through permits.

New South Wales - Recreational Catch - The most recent estimate of the recreational harvest of Mahi Mahi in NSW was approximately 25 400 fish during 2017–18 [Murphy et al., 2020]. This estimate was based on a survey of Recreational Fishing Licence (RFL) households. RFL households were comprised of at least one member who possessed a long-term (1 and 3 years duration) fishing licence and included other fishers resident within their households. Catch from exempt fishers and short-term licence holders is unknown but for Mahi Mahi long-term licence holders are estimated to be responsible for the vast majority of the catch.

CATCH CHART



Australian commercial catch of Mahi Mahi - note confidential catch not shown

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