

# Gemfish (2023)

*Rexea solandri*



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## STOCK STATUS OVERVIEW

Jurisdiction	Stock	Stock status	Indicators
Commonwealth, New South Wales, Tasmania	Eastern	Depleted	Spawning stock biomass, CPUE, fishing mortality
Commonwealth, Western Australia	Western	Sustainable	CPUE, catch

## STOCK STRUCTURE

There is genetic evidence for two biologically distinct stocks of Gemfish in Australia—an Eastern and a Western biological stock—separated by a boundary at the western end of Bass Strait [Colgan and Paxton 1997; Moore et al. 2017]. Studies suggest that there are no genetic differences between Gemfish in eastern Australia and New Zealand [Colgan and Paxton 1997]. For the purposes of assessment and management, the Eastern Australia population is treated as a single biological stock, independent of the New Zealand population.

Given the evidence of two genetically distinct stocks in Australian waters, stock status is reported accordingly. Here, assessment of stock status is presented at the biological stock level—Eastern and Western.

## STOCK STATUS

**Eastern** Eastern Gemfish is primarily caught by the Commonwealth managed Southern and Eastern Scalefish and Shark Fishery (SESSF), with small catches from State jurisdictions. Stock status classification reported here is based on stock assessments conducted for the SESSF, which include reported State catches.

Eastern Gemfish in Commonwealth fisheries was managed as a Tier 1 stock under the SESSF Harvest Strategy Framework [AFMA 2021] but is currently managed under a rebuilding strategy [AFMA 2015] with an incidental catch allowance of 100 tonnes (t). In 2009, the species was listed as Conservation dependent under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The last accepted quantitative stock assessment for Eastern Gemfish was published in 2010, using data up to 2009 [Little and Rowling 2010]. The base-case model estimated that the spawning stock biomass in 2009 was 16% of the unfished level. That assessment [Little and Rowling 2010] included projections of Eastern Gemfish biomass based on two scenarios: zero and 100 t (retained catch) each year. The projections for catches of zero and 100 t (retained catch) indicated that the spawning stock biomass may reach the limit reference point (LRP) of 20% of unfished level by 2017 and 2025, respectively, assuming average recruitment. A preliminary update of the 2010 assessment in 2016 [Little 2016], while not accepted by the South East Resource Assessment Group, indicated that the spawning stock biomass in 2015 had decreased to 8% of the unfished level, due to a prolonged period of below-average recruitment [AFMA 2016; Little 2016].

Recent research suggests that the spawning biomass in the eastern stock has fewer effective genetically successful contributors between generations [Moore et al. 2017; Ovenden et al. 2020]. The decreased effective population size in Eastern Gemfish may be related to few effective parents contributing to spawning each year or differential selection against recruits [Ovenden et al. 2020]. Contributors to the decreased effective population size of Eastern Gemfish are unclear, but climate and oceanographic conditions driving changes in species productivity, abundance and availability have been identified as potential factors inhibiting the recovery of overfished species in south-eastern Australia [Knuckey et al. 2018].

Commonwealth-landed catch in the Commonwealth Trawl Sector and Scalefish Hook Sector of the SESSF was 73.8 t in the 2021–22 fishing season, based on catch disposal records [Emery et al. 2022]. The weighted average of the previous 4 calendar years (2017–2020) was calculated and used to estimate discards and state catches of 44.1 t and 2 t, respectively [Althaus et al. 2021]. For the 2021–22 fishing season, total catch and discards were estimated to be 119.9 t.

Commercial landings in New South Wales (NSW) have declined over the past decade from 11.1 t in 2012–13 to 0.7 t during 2021–22, with nearly all catch coming from the Ocean Trap and Line fishery. NSW landings represent a small proportion of annual fishing mortality. Anecdotal evidence, including photographs and reports on social media websites, indicates that Gemfish are targeted and captured by recreational anglers. However, surveys of recreational catch in NSW during 2019–20 [Murphy et al. 2022] and previous years [Murphy et al. 2020; West et al. 2015] detected no Gemfish captures. This suggests recreational catch is negligible, relative to commercial catch.

Commercial landings in Tasmania have been negligible, the maximum annual catch remaining below 100 kg, some years with no catch reported.

The above evidence indicates that the biomass of this stock is likely to be depleted and that recruitment is likely to be impaired.

There are no reliable indicators to determine whether the current level of fishing

mortality will allow the stock to rebuild to above the LRP in a time frame consistent with the requirements of the Commonwealth Harvest Strategy Policy.

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

## Western

Western Gemfish is primarily caught by the Commonwealth managed Southern and Eastern Scalefish and Shark Fishery (SESSF), with small catches from Western Australia. Stock status classification reported here is based on the standardised catch per unit effort (CPUE) analyses conducted for the Commonwealth fishery.

In the Commonwealth, Western Gemfish is taken in the Commonwealth Trawl Sector (CTS), the Scalefish Hook Sector (SHS) and the Great Australian Bight Trawl Sector (GABTS) of the SESSF; however, a total allowable catch (TAC) applies only to the CTS and the SHS.

Western Gemfish was targeted in the GABTS from 2004 to 2007, with catches totalling 532 t. In 2008, targeted fishing for Western Gemfish in the GABTS ceased and catches became largely incidental, partly due to low prices for Gemfish and a key vessel leaving the fishery [AFMA 2010]. AFMA has not moved to implement quota for Western Gemfish in the GABTS, instead relying on a catch trigger, which would lead to the commencement of a stock assessment if the catch exceeded 1,000 t over 3 years [AFMA 2021].

Catches of the Western biological stock of Gemfish by Western Australian state commercial and recreational fisheries remains very small ( $\leq 0.1$  t in each year between 2008 and 2022). This species is caught as by-product by fishers targeting demersal species.

Western Gemfish in Commonwealth fisheries is managed as a Tier 4 stock under the SESSF Harvest Strategy Framework [AFMA 2021]. The 2019 analysis informed the management of the stock for the 2021–22 fishing season [Sporcic 2019].

The 2019 Tier 4 analysis [Sporcic 2019] estimated the recent average standardised CPUE-based proxy for biomass to be above the target reference point (48% of the unfished level) and the limit reference point, producing a recommended biological catch (RBC) of 423 t and a recommendation from the South East Resource Assessment Group to set a 3-year multi-year TAC [AFMA 2022].

However, the most recent stock structure research suggests zone 50 is an overlap zone between the eastern and western biological stocks [Ovenden et al. 2020] and that the western stock occurs west of Portland through the Great Australian Bight. As a result, the Tier 4 may not adequately assess the western stock. Future assessments should consider both zone 50 and the western biological stock.

Commonwealth-landed catch in the CTS and the SHS of the SESSF in 2021–22 was 72.7 t, based on catch disposal records [Emery et al. 2022]. The weighted average of the previous 4 calendar years (2017–20) was calculated and used to estimate discards of 19.8 t [Althaus et al. 2021]. There is no reported state catch. For the 2021–22 fishing season, total catch and discards were estimated to be 92.5 t and below the RBC of 423 t for the 2021–22 fishing season.

The above evidence suggests that the biomass of this stock is unlikely to be

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depleted and that recruitment is unlikely to be impaired. Furthermore, the above evidence indicates that the current level of fishing mortality is unlikely to cause the stock to become recruitment impaired.

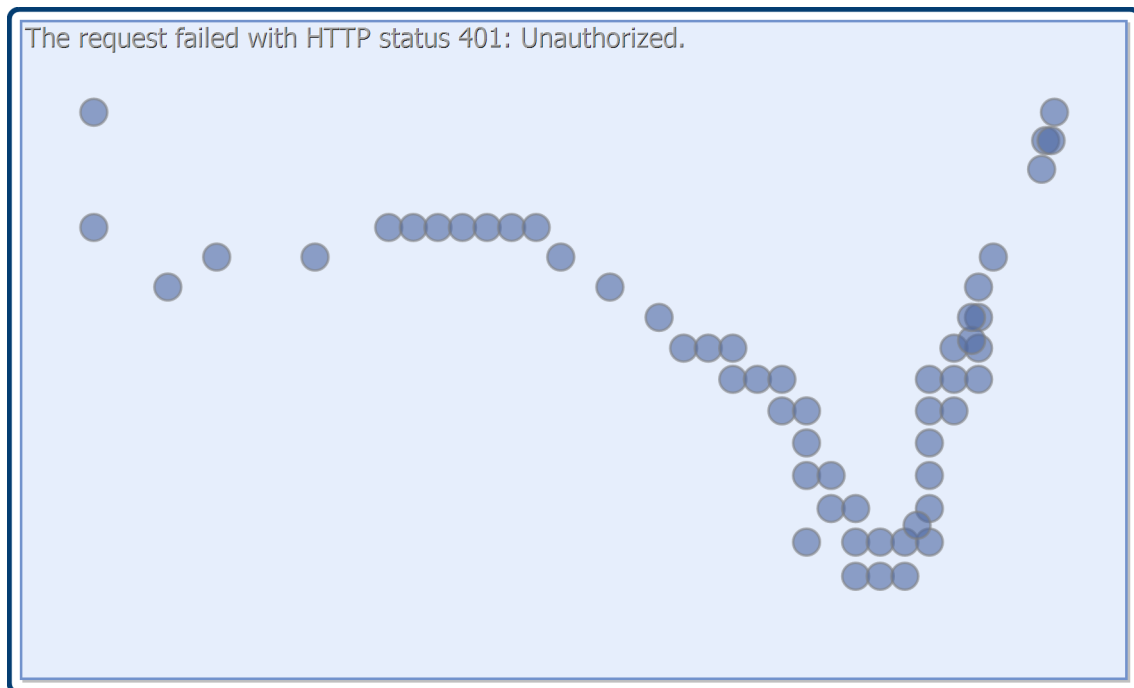
On the basis of the evidence provided above, the Western biological stock is classified as a **sustainable stock**.

**BIOLOGY**

**Gemfish biology** [Hutchins and Swainston 1986; Rowling 1999]

Species	Longevity / Maximum Size	Maturity (50 per cent)
Gemfish	Males 13 years, up to 1 060 mm TL , 15 kg Females 17 years, up to 1 160 mm TL, > 15 kg	Males 4–5 years, 600 – 660 mm TL, Females 5–6 years, 710 – 740 mm TL

**DISTRIBUTION**



Distribution of reported commercial catch of Gemfish

**TABLES**

Fishing methods	Commonweal th	New South Wales	Tasmania	Western Australia
<b>Charter</b>				
Hook and Line		✓		✓

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Rod and reel		✓		✓
<b>Commercial</b>				
Danish Seine	✓			
Demersal Longline	✓			
Dropline	✓	✓		
Hand Line, Hand Reel or Powered Reels			✓	✓
Hook and Line		✓		
Line				✓
Midwater Trawl	✓			
Otter Trawl	✓	✓		
Trawl	✓			
Various		✓		
<b>Recreational</b>				
Hook and Line		✓		✓
Rod and reel		✓		✓
Unspecified				✓

Management Methods			
	Commonwealth	New South Wales	Western Australia
<b>Charter</b>			
Bag and possession limits			✓
Bag/boat limits		✓	
Bag/possession limits		✓	
Gear restrictions		✓	✓
Licence		✓	✓
Limited entry			✓
Marine park closures		✓	✓
<b>Commercial</b>			
Catch limits		✓	

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<b>Effort limits</b>			✓
<b>Gear restrictions</b>	✓	✓	✓
<b>Limited entry</b>	✓	✓	✓
<b>Marine park closures</b>	✓	✓	
<b>Mesh size regulations</b>		✓	
<b>Spatial closures</b>	✓	✓	✓
<b>Total allowable catch</b>	✓		
<b>Total allowable catch (incidental)</b>	✓		
<b>Trip limits</b>	✓		
<b>Vessel restrictions</b>		✓	
<b>Recreational</b>			
<b>Bag/boat limits</b>		✓	
<b>Bag/possession limits</b>		✓	✓
<b>Gear restrictions</b>		✓	✓
<b>Licence</b>		✓	✓
<b>Marine park closures</b>		✓	✓

<b>Catch</b>	<b>Commonwealth</b>	<b>New South Wales</b>	<b>Tasmania</b>	<b>Western Australia</b>
<b>Charter</b>				Negligible
<b>Commercial</b>	141.738 t	0.69265 t	0 t	0.04689 t
<b>Indigenous</b>		Unknown		Unknown
<b>Recreational</b>		Negligible (2019–20)		Negligible

**Commonwealth – Commercial (Management Methods/Catch)** Data provided for the Commonwealth align with the Commonwealth Southern and Eastern Scalefish and Shark Fishery for the 2021–22 financial year.

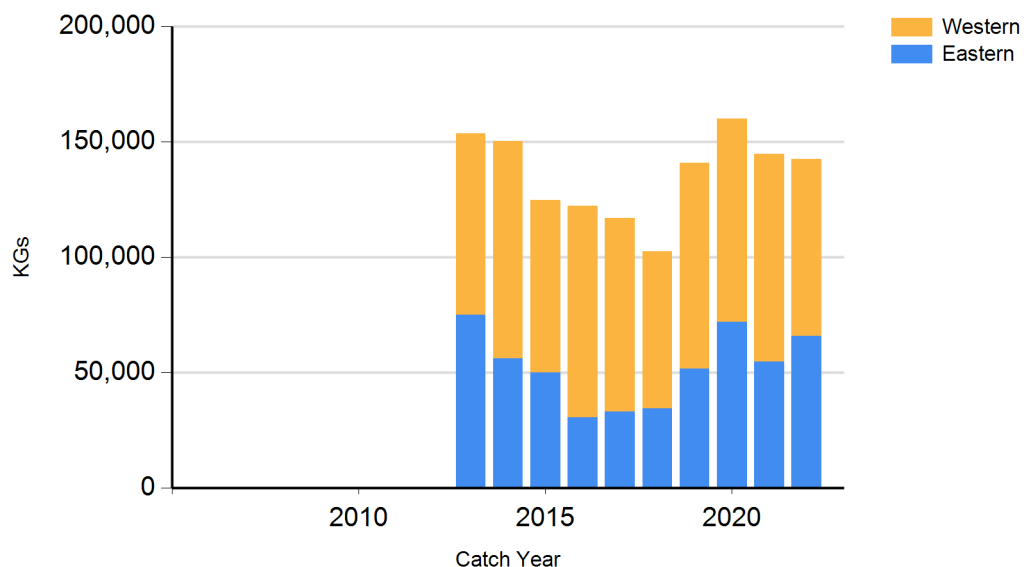
**Commonwealth – Recreational** The Commonwealth does not manage recreational fishing in Commonwealth waters. Recreational fishing in Commonwealth waters is managed by the state or territory immediately adjacent to those waters, under its management regulations.

**Commonwealth – Indigenous** The Australian government does not manage non-commercial Indigenous fishing in Commonwealth waters, with the exception of Torres Strait. In general, non-commercial Indigenous fishing in Commonwealth waters is managed by the state or territory immediately adjacent to those waters.

**New South Wales – Indigenous (Management Methods)** Cultural Fishing Management Arrangements. See <https://www.dpi.nsw.gov.au/fishing/aboriginal-fishing>.

**New South Wales - Recreational (Catch)** Catch estimate of “Negligible” is based zero catches of Gemfish recorded during the 2019–20 survey of recreational catch by 1–3 year recreational licence holders in NSW [Murphy et al. 2022].

### CATCH CHART



Commercial catch of Gemfish - note confidential catch not shown

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