

Gemfish (2020)

Rexea solandri



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STOCK STATUS OVERVIEW

Jurisdiction	Stock	Stock status	Indicators
Commonwealth, New South Wales	Eastern	Depleted	Biomass, fishing mortality
Commonwealth, Western Australia	Western	Sustainable	CPUE, fishing mortality

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. 2016]. Studies suggest that there are no genetic differences between Gemfish in eastern Australia and New Zealand [Colgan and Paxton 1997]. For the purposes of management and assessment, 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 in Commonwealth fisheries was managed as a Tier 1 stock under the Southern and Eastern Scalefish and Shark (SESSF) Harvest Strategy Framework [AFMA, 2019] 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 quantitative stock assessment for Eastern Gemfish was published in 2010, using data up to 2009 [Little & Rowling 2010]. The base-case model

estimated that the spawning stock biomass in 2009 was 16 per cent of the unfished level. That assessment [Little & Rowling 2010] included projections of Eastern Gemfish biomass that were based on 2 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 of 0.2SB0 (20 per cent of unfished levels) by 2017 and 2025, respectively, assuming average recruitment. A preliminary update of the 2010 assessment in 2016 [Little 2016], while not accepted by SERAG, indicated that the spawning stock biomass in 2015 had decreased to 8 per cent (0.08SB0), due to a prolonged period of below-average recruitment [AFMA 2016; Little 2016].

In 2008, a rebuilding strategy was implemented for Eastern Gemfish (subsequently revised in 2015) with the goal of rebuilding stocks to, or above, the limit reference point by or before 2027 (1 mean generation time plus 10 years) [AFMA 2015]. Projections to support this time frame from the 2010 assessment [Little & Rowling 2010] assume that total removals are limited to the incidental catch allowance (currently set at 100 t) and rely on at least average levels of recruitment [Morison et al. 2013].

Recent research suggests that the spawning biomass in the eastern stock has fewer effective genetically successful contributors between generations [Moore et al. 2016; Ovenden et al. 2020]. Smaller effective population size was not detected in the Western Gemfish stock. 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].

The above evidence indicates that the Eastern biological stock is depleted and that recruitment is likely to have been impaired.

Commercial landings in NSW have declined over the past decade from 20.6 t in 2009–10 to 3.0 t during 2018–19, 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 New South Wales during 2013–14 [West et al. 2015] and 2017–18 [Murphy et al. 2020] detected no Gemfish captures. It is therefore concluded that recreational catch is negligible, relative to commercial catch.

Catch landed by the Commonwealth Trawl and Scalefish Hook sectors of the SESSF was 70 t in the 2019–20 fishing season (39.1 t in 2018–19 fishing season), based on catch disposal records. Discards have been estimated to be 45.3 t based on the weighted average of the previous four calendar years (2015 to 2018) [Burch et al., 2019]. While an assessment update is understood to be scheduled for 2021, there are currently no reliable indicators to determine if this level of fishing mortality will allow the stock to rebuild to above the limit reference point within a biologically reasonable time frame.

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) and the Great Australian Bight Trawl Sector (GABTS), 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.

Catches of the Western biological stock of Gemfish by Western Australian state commercial and recreational fisheries remains very small (≤ 0.1 t in each year between 2008 and 2019). This species is caught as byproduct by fishers

targeting demersal species.

Western Gemfish in Commonwealth fisheries is managed as a Tier 4 stock under the SESSF Harvest Strategy Framework [AFMA, 2019]. The latest standardised CPUE analysis was undertaken in 2019 [Sporcic 2019] using data solely from the Commonwealth Trawl Sector (CTS) (zone 50) up to 2018. The analysis estimated that the 4-year average CPUE (2015 to 2018), including discards, was above the target reference point. This led to a Recommended Biological Catch (RBC) of 423 t.

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.

Catch landed by the Commonwealth Trawl and Scalefish Hook sectors of the SESSF was 96.2 t in the 2019–20 fishing season (78.5 t in 2018–19 fishing season). Discards have been estimated to be 41.7 t based on the weighted average of the previous four calendar years (2015 to 2018) [Burch et al., 2019], which, when combined with negligible State catch and Commonwealth landings, is below the RBC of 423 t calculated in the 2019 analysis.

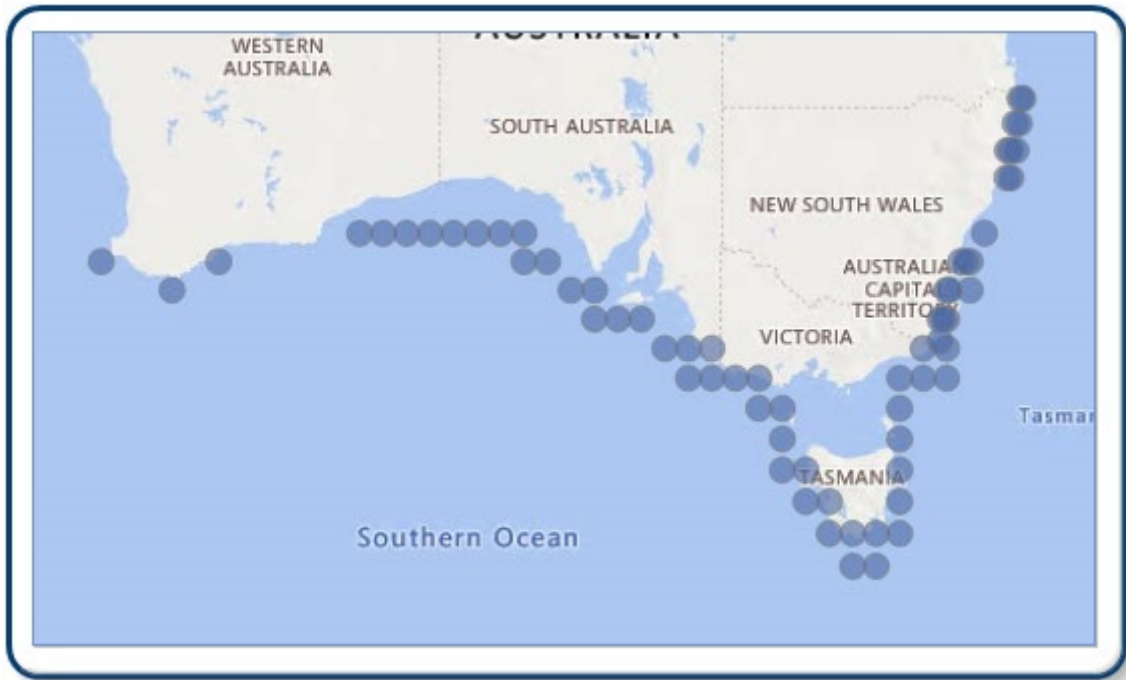
The above evidence suggests that the biomass of this stock is unlikely to be depleted and that recruitment is unlikely to be impaired. On the basis of the evidence provided above, the Western biological stock is classified as a **sustainable stock**.

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	Commonwealth	New South Wales	Western Australia
Charter			
Hook and Line		✓	
Rod and reel		✓	✓
Commercial			
Danish Seine	✓		
Demersal Longline	✓		
Dropline	✓		✓
Hand Line, Hand Reel or Powered Reels			✓
Handline (mechanised)	✓		
Line		✓	
Otter Trawl	✓		
Pelagic Longline	✓		
Various		✓	
Recreational			
Hook and Line		✓	✓
Rod and reel		✓	✓

Unspecified			✓
Management Methods	Commonwealth	New South Wales	Western Australia
Charter			
Bag and possession limits			✓
Bag/boat limits		✓	
Bag/possession limits		✓	
Gear restrictions		✓	✓
Licence		✓	✓
Limited entry			✓
Marine park closures		✓	✓
Commercial			
Catch limits		✓	
Effort limits			✓
Gear restrictions	✓	✓	✓
Limited entry	✓	✓	✓
Marine park closures	✓	✓	
Mesh size regulations		✓	
Spatial closures	✓	✓	✓
Total allowable catch	✓		
Total allowable catch (incidental)	✓		
Trip limits	✓		
Vessel restrictions		✓	
Recreational			
Bag/boat limits		✓	
Bag/possession limits		✓	✓
Gear restrictions		✓	✓
Licence		✓	✓
Marine park closures		✓	✓

Catch	Commonwealth	New South Wales	Western Australia
Commercial	136.07 t	3.01495 t	0.0898 t
Indigenous		Negligible (2017-18)	Unknown
Recreational		Negligible (2017-18)	Unknown

Commonwealth – Commercial (Management Methods/Catch) Data provided for the Commonwealth align with the Commonwealth Southern and Eastern Scalefish and Shark Fishery for the 2018-19 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.

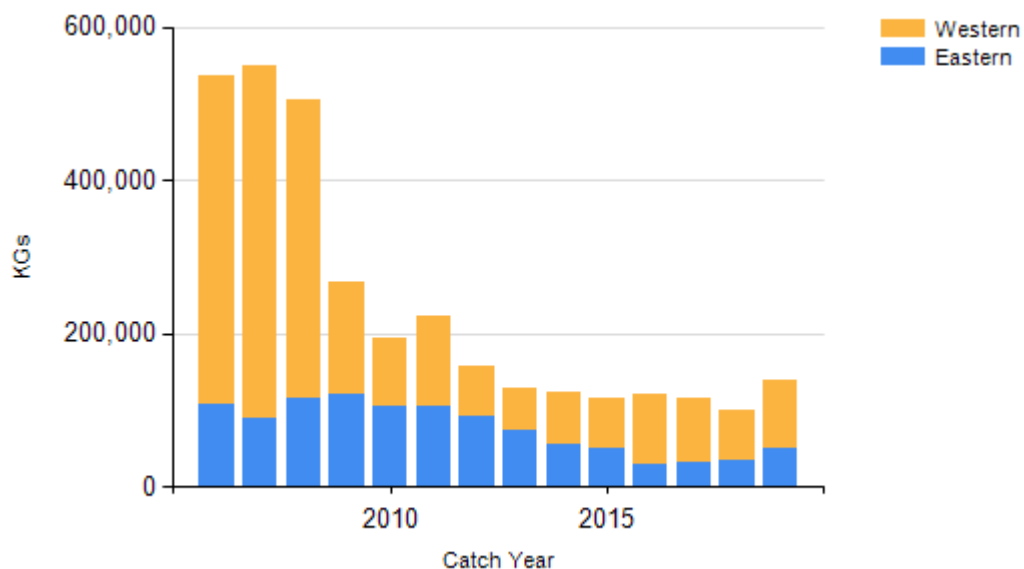
Commonwealth – Indigenous The Australian government does not manage non-commercial Indigenous fishing in Commonwealth waters, with the exception of Torres Strait. In general, non-commercial Indigenous fishing in Commonwealth waters is managed by the state or territory immediately adjacent to those waters

New South Wales – Data for New South Wales is the 2018–19 financial year.

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

New South Wales Indigenous and Recreational catch estimates of “Negligible” are based zero catches of Gemfish recorded during the 2017-18 survey of recreational catch by 1-3 year recreational licence holders in NSW [Murphy et al. 2020]

CATCH CHART



Commercial catch of Gemfish - note confidential catch not shown

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