

Gemfish (2016)

Rexea solandri



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STOCK STATUS OVERVIEW

Jurisdiction	Stock	Fisheries	Stock status	Indicators
Commonwealth	Western	SESSF (CTS), SESSF (GABTS), SESSF (GHTS)	Sustainable	Biomass, fishing mortality
Commonwealth, New South Wales	Eastern	OTF, OTLF, SESSF (CTS), SESSF (GHTS)	Overfished	Biomass, fishing mortality

SESSF (CTS) Southern and Eastern Scalefish and Shark Fishery (Commonwealth Trawl Sector) (CTH), SESSF (GABTS) Southern and Eastern Scalefish and Shark Fishery (Great Australian Bight Trawl Sector) (CTH), SESSF (GHTS) Southern and Eastern Scalefish and Shark Fishery (Gillnet Hook and Trap Sector) (CTH), OTF Ocean Trawl Fishery (NSW), OTLF Ocean Trap and Line (NSW)

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[1,2]. Studies suggest that there are no genetic differences between Gemfish in eastern Australia and New Zealand[2]. For the purposes of management and assessment, the eastern Australian 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 Historically high catches of Gemfish from the Eastern biological stock through the 1970s and 1980s substantially reduced the biomass of Eastern Gemfish by

the 1990s[3]. The biological stock has remained at a depressed level, with limited recruitment over this period[4]. The most recent assessment[4] estimated that biomass in 2010 was 15.6 per cent of the unfished (1968) level. Based on this evidence, the stock is considered to be recruitment overfished[5].

A recent study suggests that the spawning biomass in the Eastern stock has fewer effective genetically successful contributors between generations than expected[1]. Smaller effective population size was not detected in the Western Gemfish stock. Hybridisation between east and west populations was detected, but there was no evidence of introgression of genetic material between either population, suggesting all hybrids are sterile. The decreased effective population size in Eastern Gemfish may be related to wasted reproductive effort in producing sterile hybrids, in combination with an overfished stock.

A spawning potential ratio analysis[6] indicated high fishing mortality rates on Eastern Gemfish until the late-1990s, but much lower rates since 2002. Because fishing mortality rates have substantially decreased, assessment model projections indicate that the stock should reach 20 per cent of unfished biomass by 2025[4], which is less than the one generation time plus 10 years required under the Commonwealth Fisheries Harvest Strategy Policy[7].

This rebuilding projection, however, is based on future recruitments determined from the stock recruitment relationship and total removals being limited to the 100 tonnes (t) incidental catch allowance (no targeting is allowed). If these assumptions are not met, the time required to rebuild the stock may be underestimated.

Discards were estimated at 131 t in 2013, which was around double the catch in that year. The combined mortality of 183 t is in excess of the 100 t incidental bycatch level that would allow rebuilding. Discarding decreased to 33 t in 2014, with a combined total catch of 70 t[8]. Total landed catch in 2015–16 was 30 t, however discard estimates are not available for this period and therefore total removals cannot be determined. It is uncertain whether current fishing pressure has been reduced by management to a level that should allow the stock to recover from its recruitment overfished state.

Anecdotal evidence indicates that some recreational anglers target Gemfish, however, a survey of recreational catch in New South Wales during 2013–14 detected no Gemfish captures[9].

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

Western

The catch from the Western Australian component of this stock has been negligible, averaging a little over 5 kg per year between 2004 and 2014, with no reported catch in 2015. In view of these low catches, status determination for this stock is based on evidence for the Commonwealth fisheries.

An updated integrated stock assessment was conducted for the Western biological stock of Gemfish in the Commonwealth Trawl Sector and Great Australian Bight Trawl Sector (Commonwealth) in 2013[10]. The most recent assessment[10] estimates that biomass in 2013 was 74 per cent of the unfished (1985) level. The stock is not considered to be recruitment overfished[5].

A catch-rate analysis[11] for the Commonwealth Trawl Sector estimated that catch rates were above the Commonwealth limit but below the target catch rate (based on a historical reference catch period).

The total allowable catch for the Southern and Eastern Scalefish and Shark Fishery (Commonwealth) for the 2015–16 fishing season was 199 t. Landed

catch of Western Gemfish from this fishery in the 2015–16 fishing season was 84 t. Discards in 2013 were estimated at 69 per cent of the catch, dropping to 24 per cent of the catch in 2014. Discard estimated for 2015 were not available at the time of writing. However, total catch and discarding have remained at, or below, the total allowable catch in recent years and are not expected to exceed it in 2015. This level of fishing pressure is unlikely to cause the stock to become recruitment overfished.

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

BIOLOGY

Gemfish biology[12–14]

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

DISTRIBUTION



Distribution of reported commercial catch of Gemfish

TABLES

Commercial Catch Methods	Commonwealth	New South Wales
Danish Seine	✓	
Demersal Gillnet	✓	
Demersal Longline	✓	

Demersal Pair Trawl	✓	
Dropline	✓	✓
Hand Line, Hand Reel or Powered Reels	✓	✓
Midwater Trawl	✓	
Otter Trawl	✓	✓
Setline		✓

Fishing methods		
	Commonwealth	New South Wales
Commercial		
Danish Seine	✓	
Demersal Longline	✓	
Dropline	✓	✓
Hand Line, Hand Reel or Powered Reels		✓
Midwater Trawl	✓	
Otter Trawl	✓	✓
Setline		✓
Indigenous		
Hand Line, Hand Reel or Powered Reels		✓
Recreational		
Hand Line, Hand Reel or Powered Reels		✓

Management Methods		
	Commonwealth	New South Wales
Commercial		
Gear restrictions	✓	✓
Limited entry	✓	✓
Spatial closures	✓	✓
Total allowable	✓	

catch (incidental)		
Trip limits	✓	✓
Indigenous		
Aboriginal cultural fishing authority		✓
Bag limits		✓
Gear restrictions		✓
Spatial closures		✓
Recreational		
Bag limits		✓
Gear restrictions		✓
Spatial closures		✓
Active Vessels		
	Commonwealth	New South Wales
	42 License in SESSF (CTS), 3 License in SESSF (GABTS), 6 License in SESSF (GHTS),	11 License in OTF, 20 License in OTLF,

SESSF (CTS) Southern and Eastern Scalefish and Shark Fishery (Commonwealth Trawl Sector)(CTH)

SESSF (GABTS) Southern and Eastern Scalefish and Shark Fishery (Great Australian Bight Trawl Sector)(CTH)

SESSF (GHTS) Southern and Eastern Scalefish and Shark Fishery (Gillnet Hook and Trap Sector)(CTH)

OTF Ocean Trawl Fishery(NSW)

OTLF Ocean Trap and Line(NSW)

Catch	Commonwealth	New South Wales
Commercial	103.141t in SESSF (CTS), 2.7025t in SESSF (GABTS), 8.04925t in SESSF (GHTS),	0.283635t in OTF, 5.88807t in OTLF,
Indigenous		Unknown
Recreational		Unknown

SESSF (CTS) Southern and Eastern Scalefish and Shark Fishery (Commonwealth Trawl Sector) (CTH), SESSF (GABTS) Southern and Eastern Scalefish and Shark Fishery (Great Australian Bight Trawl Sector) (CTH), SESSF (GHTS) Southern and Eastern Scalefish and Shark Fishery (Gillnet Hook and Trap Sector) (CTH), OTF Ocean Trawl Fishery (NSW), OTLF Ocean Trap and Line (NSW),

a Commonwealth and New South Wales Data for the Commonwealth align with the Commonwealth Southern and Eastern Scalefish and Shark Fishery 2015–16 fishing season (1 May 2015–30 April 2016). Data for New South Wales align with the 2015 calendar year.

b Commonwealth – Recreational The Australian Government 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.

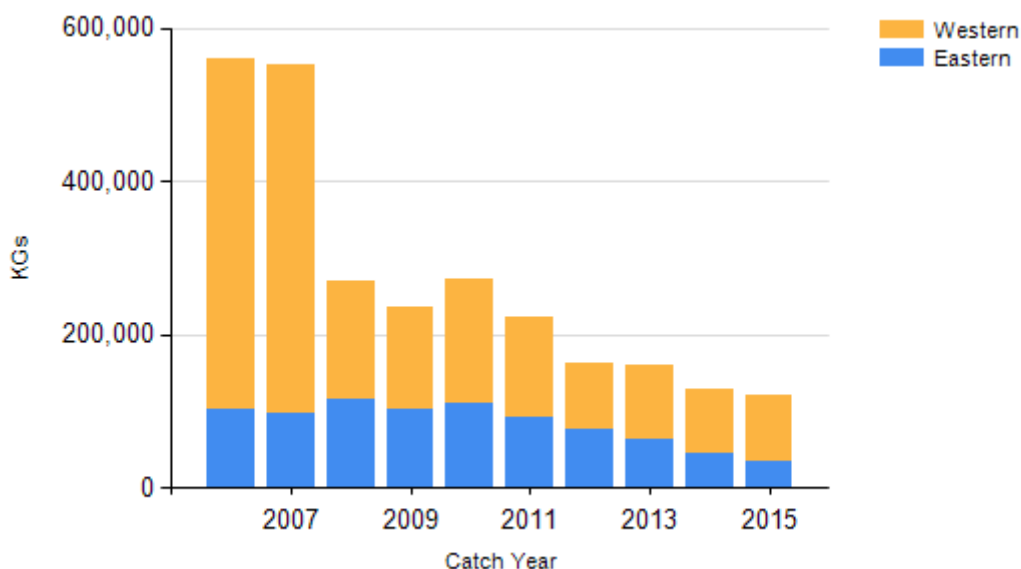
c Commonwealth – Indigenous The Australian Government does not manage non-commercial Indigenous fishing in Commonwealth waters, with the exception of the Torres Strait. In general, non-commercial Indigenous fishing in Commonwealth waters is managed by the state or territory immediately adjacent to those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

d New South Wales – Indigenous (management methods) The Aboriginal Cultural Fishing Interim Access Arrangement allows an Indigenous 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.

e New South Wales – Indigenous (management methods) The Aboriginal cultural fishing authority is the authority that Indigenous persons can apply to take catches outside the recreational limits under the Fisheries Management Act 1994 (NSW), Section 37 (1)(c1), Aboriginal cultural fishing authority.

f New South Wales – Indigenous (catch) A survey of recreational fishing in NSW and the ACT during 2013–149 did not detect the capture of any Gemfish. However, recreational catch of Gemfish is known to occur. Hence, the magnitude of recreational catch is listed as “0 t”, indicated an unknown but relatively small catch.

CATCH CHART



Commercial catch of Gemfish - note confidential catch not shown

EFFECTS OF FISHING ON THE MARINE ENVIRONMENT

- There is bycatch in the fish trawl sector. In 2006, mandatory requirements for otter trawls to use 90 mm square-mesh codend panels were introduced in an effort to reduce the catch of small species and juvenile fish[15].
- Interactions also occur with animals protected under the *Environment Protection and Biodiversity Conservation Act 1999*, including marine mammals (dolphins, seals and sea lions), seabirds, some shark species and seahorses and pipefish (syngnathids). These interactions are reported quarterly by the Australian Fisheries Management Authority (AFMA)[16] and on-board observer programs are used to validate the reporting in commercial logbooks.
- In 2007, the South East Trawl Fishing Industry Association released an industry code

of practice that aims to minimise interactions with fur seals, as well as addressing the environmental impacts of the fishery more generally[17]. Operators have developed other mitigation protocols that have further reduced seal mortalities, including using breakaway ties that keep the net closed until it is below depths that seals regularly inhabit, adopting techniques to close the trawl opening during recovery to minimise opportunities for seals to enter the net, switching off gantry lights that are not required during night trawling to avoid attracting bait species and seals, and dumping offal only when the boat is not engaged in deploying or hauling gear[17].

- The AFMA mandated individual vessel seabird management plans[18]. The seabird action plans are used in the Southern and Eastern Scalefish and Shark Fishery (Commonwealth Trawl Sector) (SESSF [CTS]) to mitigate the impacts of trawling on seabirds. From 1 May 2017, all vessels in the SESSF(CTS) and Southern and Eastern Scalefish and Shark Fishery (Great Australian Bight Trawl Sector) (Commonwealth) (SESSF [GABTS]) fisheries must use one of the following mitigation devices: sprayers; bird bafflers; or pinkies with zero discharge fish waste[19].
- The effects of trawl fishing on the marine environment are assessed through an environmental risk assessment and risk management framework and mitigated through spatial closures, and the implementation of bycatch and discard workplans in the SESSF (CTS) and SESSF (GABTS) fisheries[20,21].
- The Eastern biological stock of Gemfish is listed as 'Conservation Dependent' under the *Environment Protection and Biodiversity Conservation Act 1999*[22] and is subject to a stock rebuilding strategy[23].

ENVIRONMENTAL EFFECTS on Gemfish

- The abundance of Gemfish is likely to be affected by environmental conditions, including ocean currents and temperatures, which may influence habitat suitability, food availability and recruitment[24].

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