

# Blue-eye Trevalla (2016)

*Hyperoglyphe antarctica*



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## STOCK STATUS OVERVIEW

Jurisdiction	Stock	Fisheries	Stock status	Indicators
Commonwealth, Queensland, New South Wales, Tasmania	Eastern Australia	OTLF, RRFFF, SESSF (CTS), SESSF (GHTS), SF	Sustainable	Catch, CPUE, fishing mortality
Western Australia	Western Australia	JASDGLMF, WCDSIMF, WL (SC)	Sustainable	Catch, fishing mortality

SESSF (CTS) Southern and Eastern Scalefish and Shark Fishery (Commonwealth Trawl Sector) (CTH), SESSF (GHTS) Southern and Eastern Scalefish and Shark Fishery (Gillnet Hook and Trap Sector) (CTH), OTLF Ocean Trap and Line (NSW), RRFFF Rocky Reef Fin Fish Fishery (QLD), SF Scalefish Fishery (TAS), JASDGLMF Joint Authority Southern Demersal Gillnet and Demersal Longline Managed Fishery (Zone 1 & Zone 2) (WA), WCDSIMF West Coast Demersal Scalefish (Interim) Managed Fishery (WA), WL (SC) Open Access in the South Coast (WA)

## STOCK STRUCTURE

A single biological stock of Blue-eye Trevalla (incorporating the continental shelf, seamounts and the Cascade Plateau) is assumed for eastern Australian waters, separate from the New Zealand stock(s)[1]. The connectivity between south-western and south-eastern Australia is unknown; considering their relative isolation by distance, it is assumed that south-western Australia represents a single biological stock, separate to an eastern Australian stock.

Genetic studies have found no evidence of Blue-eye Trevalla population structuring between different regions in the area of the Southern and Eastern Scalefish and Shark Fishery (SESSF)[2]. However, otolith microchemistry (elemental and stable isotope analysis) has suggested some stock structuring, principally between the East Coast Deepwater Trawl Sector offshore seamount fishery and the New Zealand region (which appear to form one group) and the rest of Australia's SESSF[3]. Sampling of ages and lengths of individuals recruited to the fishery also suggests heterogeneity in size and age composition between different areas of the SESSF[3]. The Commonwealth Scientific and Industrial Research Organisation is using otolith chemistry to investigate Blue-eye Trevalla subpopulation structure, to clarify connectivity between the SESSF, the East Coast Deepwater Zone and on seamounts and the Lord Howe Rise outside Australia's exclusive economic zone. The project is also using ocean circulation

models to infer patterns of dispersal and recruitment.

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

## STOCK STATUS

### Eastern Australia

Catches of the Eastern Australian biological stock of Blue-eye Trevalla are currently taken in the Southern and Eastern Scalefish and Shark Fishery (Commonwealth Trawl Sector), Deep Water Fin Fish Fishery (Queensland) (DWFFF), Southern and Eastern Scalefish and Shark Fishery (Gillnet, Hook and Trap Sector) (Commonwealth) (SESSF [GHTS]) and Ocean Trap and Line Fishery (New South Wales) (OTLF). Prior to 1998, catches were also taken in the Scalefish Fishery (Tasmania). Average annual catches in these fisheries have declined from 537 tonnes (t) per year in 2006–10, to 363 t per year in 2011–14, to 319 t in 2015. Throughout the period, the Commonwealth fisheries (primarily the SESSF [GHTS]) have made 85–95 per cent of the catch, with New South Wales contributing about six–eight per cent and Queensland about one–six per cent. Assessment of this stock is therefore based primarily on stock assessments for the SESSF (GHTS) fishery.

Blue-eye Trevalla caught off south-east Queensland are at the northern-most limit of their distribution. They were a key species in the DWFFF until 2012 and have been incidentally harvested in the Rocky Reef Fin Fish Fishery since. There has been no reported effort in the DWFFF since 2012. Catch and effort for Blue-eye Trevalla since 2005 have been highly variable ranging from a peak of 58 t and 168 fishing days in 2009 to 1 t and 23 days' effort in 2015. No recreational harvest of Blue-eye Trevalla has been reported in recent surveys[4].

Catches in excess of 90 t per year were made in the New South Wales Ocean Trap and Line Fishery (OTLF) in the late-1900s, peaking at 122 t in 1999. Since then, catches by this fishery have declined steadily to 19.6 t in 2015. No separate assessments have been conducted for New South Wales Blue-eye Trevalla.

Blue-eye Trevalla caught in the south-eastern region of the Eastern Australian biological stock's distribution (Commonwealth fishing zones 10–50) constitute most of the catch of this stock. This stock component is assessed as a tier 4 stock under the Southern and Eastern Scalefish and Shark Fishery Harvest Strategy Framework using catch and effort data for the auto-longline and dropline fisheries. The reliability of catch per unit effort (CPUE) as an index of abundance for this stock is complicated by differences in CPUE trends to the east and west of Bass Strait; the possible influence of Orca (*Orcinus orca*) depredation on CPUE; and the effects of spatial closures implemented to rebuild Gulper Shark stocks[5–7].

The most recent tier 4 assessment in 2015[8] used a combined dropline and auto-line series normalised to their averages for the overlap period (2002–06). A sensitivity analysis that included Orca depredation indicated that depredation, when considered as a 'discard', would result in a higher CPUE index and recommended biological catch (RBC). However, as this estimate was based on a single vessel, it was not used in the RBC calculation for the stock[8]. It was noted by Slope Resource Assessment Group (SlopeRAG) that not accounting for possible effects of orca depredation added precaution to the RBC estimate[9–10].

The 2015 assessment showed recent CPUE for the combined east and west

components increased in 2014 to near the target reference level. The recent 4-year average CPUE (2011–14) produced an RBC of 444 t for the 2016–17 fishing season. SlopeRAG recommended that the tier 4 discount factor not be applied because of the likely conservative estimate of the RBC and the protection afforded by closures[9]. After deduction of state catches and addition of under-catch allowance, the 2015–16 TAC was set at 363 t[11]. The 2015–16 landed catch by the Commonwealth fisheries was 299 t, which was approximately 82 per cent of the TAC of 363 t and 67 per cent of the 2016–17 RBC. Current fishing pressure, below what is considered to be a conservative TAC, is unlikely to result in the stock becoming recruitment overfished.

There is insufficient evidence to independently classify the status of the New South Wales and Queensland components of the Eastern Australian biological stock, although these make a small contribution to the overall catch and are unlikely to significantly affect determination of stock status for the entire Eastern Australian stock.

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

## Western Australia

Stock assessment for Blue-eye Trevalla in the Western Australian biological stock is based on assessment of fishing mortality derived from catch curve analysis of representative samples of the age structure in the state-managed demersal fisheries (West Coast Demersal Scalefish Interim Managed Fishery, Joint Authority Southern Demersal Gillnet and Demersal Longline Managed Fishery and Wet Line Fishery [South Coast] [Western Australia]). These fishing mortality based assessments use reference levels based on ratios of fishing mortality (F) and natural mortality (M) for each species:  $F_{target} = 2/3M$ ,  $F_{threshold} = M$  and  $F_{limit} = 3/2M$ . Recent fishing mortality based assessments indicated that the estimated fishing mortality rate on Blue-eye Trevalla in this biological stock was stable at close to the threshold level in 2011 and 2014. This indicates that current fishing pressure is not having an unacceptable impact on the age structure of the population. The above evidence indicates that the biomass of this stock is unlikely to be recruitment overfished.

Blue-eye Trevalla catches from the state-managed demersal fisheries (Western Australian biological stock) from 1999–2015 ranged between 1.4 and 19.0 t, with catches in recent years (2008–15) averaging 4.6 t per year. The above evidence indicates that 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 Western Australian biological stock is classified as a **sustainable stock**.

## BIOLOGY

Blue-eye Trevalla biology[12,13]

Species	Longevity / Maximum Size	Maturity (50 per cent)
Blue-eye Trevalla	Eastern Australia: 42 years; 1 400 mm <u>TL</u> Western Australia: 65 years; 1 300 mm <u>TL</u>	Males 620 mm <u>TL</u> , females 720 mm <u>TL</u> Males 8–9 years, females 11–12 years

## DISTRIBUTION



Distribution of reported commercial catch of Blue-eye Trevalla

**TABLES**

Commercial Catch Methods	Commonwealth	New South Wales	Queensland	Tasmania	Western Australia
Danish Seine	✓				
Demersal Gillnet	✓				
Demersal Longline	✓				
Dropline	✓	✓			
Hand Line, Hand Reel or Powered Reels	✓	✓			
Line			✓		
Midwater Trawl	✓				
Otter Trawl	✓				
Setline		✓			
Trotline	✓				
Unspecified				✓	
Various					✓

Fishing methods	Commonwealth	New South Wales	Queensland	Tasmania	Western Australia
<b>Commercial</b>					
Danish Seine	✓				
Demersal Longline	✓				

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Dropline	✓	✓			
Hand Line, Hand Reel or Powered Reels	✓	✓			
Line			✓		
Otter Trawl	✓				
Setline		✓			
Unspecified				✓	
Various					✓
<b>Recreational</b>					
Hand Line, Hand Reel or Powered Reels		✓	✓	✓	✓
Setline				✓	
<b>Management Methods</b>					
	<b>Commonwealth</b>	<b>New South Wales</b>	<b>Queensland</b>	<b>Tasmania</b>	<b>Western Australia</b>
<b>Commercial</b>					
Gear restrictions	✓	✓	✓	✓	✓
Limited entry	✓	✓	✓	✓	✓
Spatial closures	✓	✓	✓		✓
Spatial zoning					✓
Total allowable catch	✓				
Total allowable effort					✓
Vessel restrictions					✓
<b>Indigenous</b>					
Bag limits		✓			
Spatial closures		✓			
Trip limits		✓			
<b>Recreational</b>					
Bag limits		✓		✓	✓
Licence		✓		✓	✓
Limited entry		✓			✓
Passenger restrictions		✓			✓
Spatial closures		✓		✓	✓

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Spatial zoning					✓
Trip limits		✓		✓	

Active Vessels	Commonwealth	New South Wales	Queensland	Tasmania	Western Australia
	54 Vessel in SESSF (CTS), 18 Vessel in SESSF (GHTS),	30 Vessel in OTLF,	0 Vessel in DWFFF,	0 Vessel in SF,	21 Vessel in JASDGLMF, 37 Vessel in WCDSCMF, 69 Vessel in WL (SC),

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

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

**OTLF** Ocean Trap and Line(NSW)

**DWFFF** Deep Water Fin Fish fishery(QLD)

**SF** Scalefish Fishery(TAS)

**JASDGLMF** Joint Authority Southern Demersal Gillnet and Demersal Longline Managed Fishery (Zone 1 & Zone 2)(WA)

**WCDSCMF** West Coast Deep Sea Crustacean Managed Fishery(WA)

**WL (SC)** Open Access in the South Coast(WA)

Catch	Commonwealth	New South Wales	Queensland	Tasmania	Western Australia
<b>Commercial</b>	19.8422t in SESSF (CTS), 278.39t in SESSF (GHTS),	19.5827t in OTLF,	0.979t in RRFFF,		0.208725t in JASDGLMF, 0.736t in WCDSIMF, 3.176t in WL (SC),
<b>Indigenous</b>	Unknown	Unknown	Unknown	Unknown	Unknown
<b>Recreational</b>	Unknown	Unknown	Unknown	12.5 t (2011–12)	Negligible

SESSF (CTS) Southern and Eastern Scalefish and Shark Fishery (Commonwealth Trawl Sector) (CTH), SESSF (GHTS) Southern and Eastern Scalefish and Shark Fishery (Gillnet Hook and Trap Sector) (CTH), OTLF Ocean Trap and Line (NSW), RRFFF Rocky Reef Fin Fish Fishery (QLD), SF Scalefish Fishery (TAS), JASDGLMF Joint Authority Southern Demersal Gillnet and Demersal Longline Managed Fishery (Zone 1 & Zone 2) (WA), WCDSIMF West Coast Demersal Scalefish (Interim) Managed Fishery (WA), WL (SC) Open Access in the South Coast (WA),

**a New South Wales – Commercial** Dropline cannot be automated in New South Wales.

**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)** 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 (fishing methods)** Aboriginal cultural fishing authority - 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.

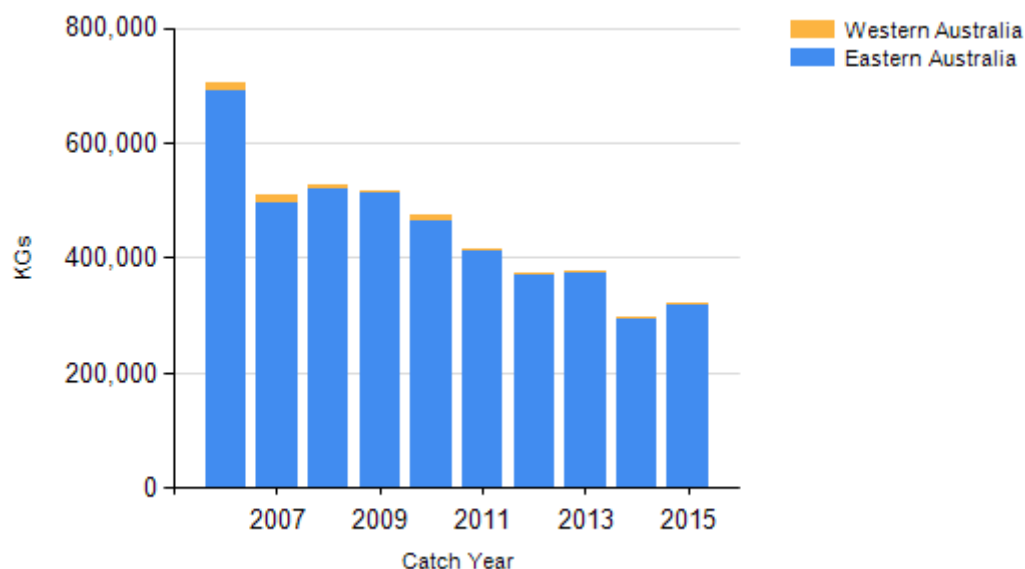
**f Queensland – Indigenous (management methods)** In Queensland, under the Fisheries Act 1994 (Qld), Indigenous fishers are able to use prescribed traditional and non-commercial fishing apparatus in waters open to fishing. Size and possession limits, and seasonal closures do not apply to Indigenous fishers. Further exemptions to fishery regulations may be applied for through permits.

**g Tasmania – Recreational (management methods)** In Tasmania, a recreational licence is required for fishers using dropline or longline gear, along with nets, such as gillnet or beach seine.

**h Tasmania – Charter (management methods)** In New South Wales there are four charter boat endorsement categories (Estuarine Fishing; Nearshore Bottom Fishing and Sportfishing; Gamefishing; and Deep Sea Bottom Fishing). The different categories have limitations on the species of fish they can access.

**i Tasmania – Indigenous (management methods)** In Tasmania, aborigines engaged in aboriginal fishing activities in marine waters are exempt from holding recreational fishing licences, but must comply with all other fisheries rules as if they were licensed. Additionally, recreational bag and possession limits also apply. If using pots, rings, set lines or gillnets, Aborigines must obtain a unique identifying code (UIC). The policy document Recognition of Aboriginal Fishing Activities for issuing a Unique Identifying Code (UIC) to a person for Aboriginal Fishing activity explains the steps to take in making an application for a UIC.

## CATCH CHART



Commercial catch of Blue-eye Trevalla - note confidential catch not shown.

## EFFECTS OF FISHING ON THE MARINE ENVIRONMENT

- Interactions can occur with animals protected under the *Environment Protection and Biodiversity Conservation Act 1999*, including marine mammals, seabirds, some shark species and seahorses and pipefish (syngnathids). These interactions are reported quarterly by the Australian Fisheries Management Authority[15] and on-board observer programs are used to validate the reporting in commercial logbooks.
- Most of the catch of Blue-eye Trevalla is taken using bottom longline or dropline methods, some of which are automated. These methods may result in interactions with seabirds, marine mammals and marine reptiles. The Threat Abatement Plan 2014 for the incidental catch (or bycatch) of seabirds during longline fishing operations[16] aims to achieve zero bycatch of seabirds from longline fishing in Commonwealth fisheries.
- From 1 May 2017, all vessels in the Southern and Eastern Scalefish and Shark Fishery

(Commonwealth Trawl Sector) and Southern and Eastern Scalefish and Shark Fishery (Great Australia Bight Trawl Sector) (Commonwealth) fisheries must use one of the following mitigation devices: sprayers, bird bafflers or pinkies, with zero discharge of fish waste[17].

- The Australian Government is currently developing a National Plan of Action for seabirds, which is intended to specify seabird interaction mitigation requirements for all Commonwealth and jointly-managed fisheries using all fishing methods.
- The Blue-eye Trevalla fishery is known to interact with Orcas (*Orcinus orca*), which can cause fish losses through predation. There are no reported Orca mortalities as a result of Blue-eye Trevalla longline/dropline fishing.

#### ENVIRONMENTAL EFFECTS on Blue-eye Trevalla

- Blue-eye Trevalla is a deepwater species that spends most of its life in close association with the seabed at depths of between 200 and 600 m. Juveniles have been found at the surface, mostly in association with floating kelp and other debris, and can also occur at mid-depths. Larvae and juveniles may be partly dependent on ocean currents for dispersion (unpublished data, Commonwealth Scientific and Industrial Research Organisation).
- Climate change may cause major changes in species distribution, community composition and ecosystem function for south-east Australian demersal fisheries[18].

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