# Stock status summary

The fishery scientific assessment summarised in this report and considered adequate to meet the legislative requirements for supporting a Total Allowable Catch (TAC) determination for NSW Blue-eye Trevalla is that done by the CSIRO, commissioned by the Australian Fisheries Management Authority (AFMA) and published as 'Blue-eye Trevalla (*Hyperoglyphe antarctica*)' by the Australian Bureau of Agricultural and Resource Economics and Sciences (Patterson et al. 2017; hereinafter referred to as the Commonwealth assessment).

The structure of this stock status summary is consistent with a format to inform a species status determination against criteria for the Status of Australian Fish Stocks (SAFS; www.fish.gov.au/). It does not attempt to replicate the detail of the Commonwealth assessment but sources and cites key information from that assessment. Where data are unavailable or considered insufficient to reliably inform the SAFS criteria the summary has been populated with 'NA', rather than removing the criteria. This format has been maintained to transparently represent the data available and highlight areas where supplementary information, alternate data sources or analyses may be required to improve the assessment and determination of species status into the future.

## Biology and stock structure

Blue-eye Trevalla (*Hyperoglyphe antarctica*) are distributed in continental slope waters off South America, South Africa, New Zealand and Australia. Their Australian distribution stretches along the southern continental margin in waters from Moreton Island in Queensland to 30°S in Western Australia. Blue-eye Trevalla also occur on the seamounts off eastern Australia and south of Tasmania, Lord Howe Island and Norfolk Island.

Adults and sub-adults occur in mid-water at depths of around 500 m and are associated with rocky ground on the continental slope where the majority of fish are found between 200 and 600 m, but a small number have been reported to occur at depths of up to 900 m.

Analysis of Blue-eye Trevalla samples from Tasmania found that 72 cm fork length (FL) is the average size at maturity for females (corresponding to about 11–12 years of age) and for males the average is 62 cm FL (8–9 years of age).

Williams et al. (2016) provided a strong evidence base for the stock structure of Blue-eye Trevalla within Australian waters. Implications of the outputs from Williams et al. (2016) on the assessment and management of Australian Blue-eye stocks have yet to be realised.

Within the Commonwealth, Blue-eye Trevalla is managed as a single biological stock in the Southern and Eastern Scalefish and Shark Fishery (SESSF; Patterson et al. 2017).

Previous national assessments (SAFS) have defined a single biological stock of Blue-eye Trevalla (incorporating the continental shelf, seamounts and the Cascade Plateau) for eastern Australian waters (Georgeson et al. 2016)

## Stock status and assessment method

The Commonwealth assessment classifies the Blue-eye Trevalla stock as not overfished and not subject to overfishing (Patterson et al. 2017).

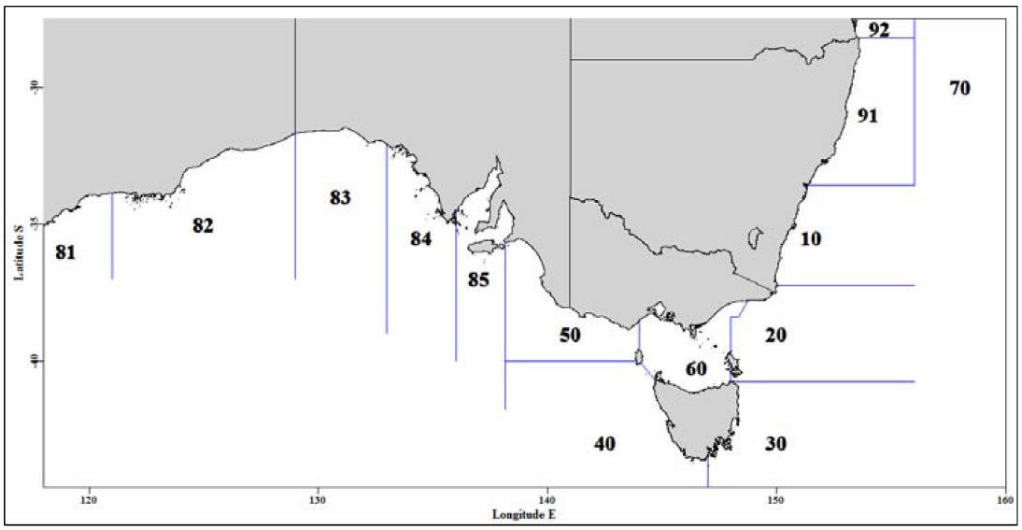
The Commonwealth assessment for Blue-eye Trevalla is a Tier 4 assessment (AFMA 2017)

The status of the eastern Australian stock of Blue-eye Trevalla was defined as **sustainable**, under the criteria for SAFS in 2016 (the first year of SAFS assessment; Georgeson et al. 2016). SAFS assessment of Blue-eye Trevalla is scheduled for 2018. At the time of this report the 2018 status determination had not been published.

## Fishery statistics summary

Fishery statistics presented in this report are restricted to those used to inform the Commonwealth assessment and are summarised here from Patterson et al. (2017) and references therein. The Commonwealth Tier 4 assessment of Blue-eye Trevalla used catch per unit effort (CPUE) data (catch per hook) from dropline data (1997–2006) and auto-longline data (2002–2015) from Commonwealth fishing zones 20, 30, 40 and 50, with the CPUE series using catch-weighted average CPUE from the two data series between 2002 and 2006; and catch from the entire SESSF, excluding that from the Great Australian Bight (GAB) fishery (see figure below; Haddon 2016).

Amended from Haddon (2016)



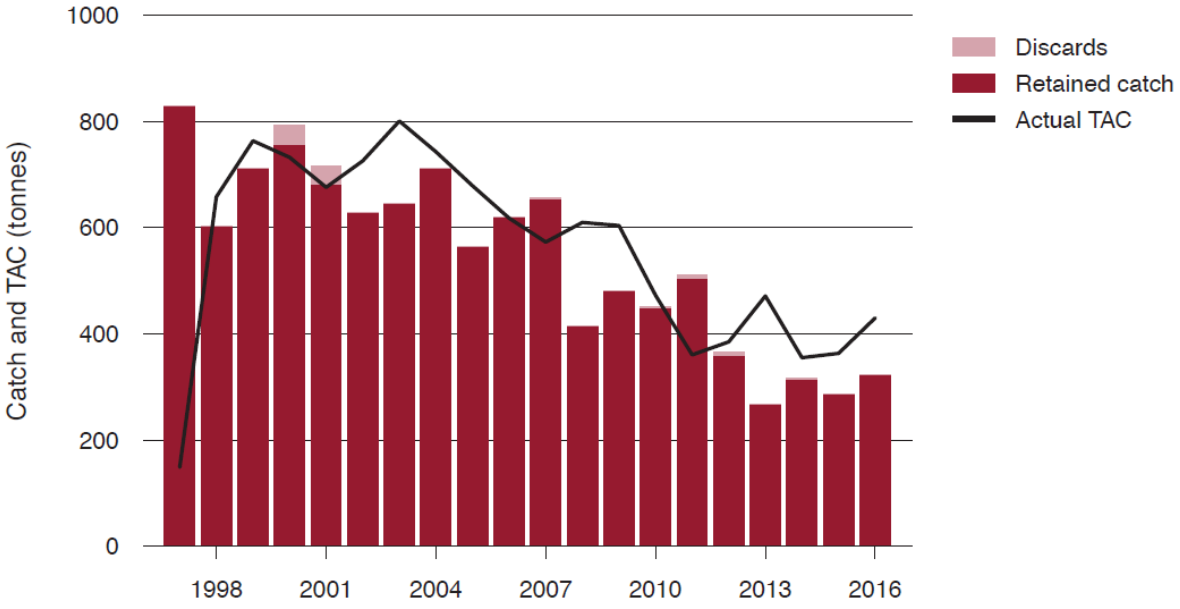

A schematic diagram depicting the statistical reporting zones in the SESSF. The GAB fishery is to the west of Zone 50. The main SESSF trawl zones are zones 10 – 50. Each zone extends out to the boundary of the EEZ, except for zones 50 and 60, and for zones 92 and 91, which are bounded by zone 70.

## Catch information

The description of catch information below is summarised from Paterson et al. (2017).

Blue-eye Trevalla catch peaked at over 800 t in 1997 (Figure 1). Commonwealth landed catch in the 2016/17 fishing season was 432 t. The weighted average discards between 2012 and 2015 were 0.73 t (Thomson and Upston 2016). Commonwealth catches have varied in response to changes in the TAC, but in some years there has been uncaught quota.

For the 2016/17 fishing season, the agreed TAC was 410 t, the actual TAC was 430.121 t and the recommended biological catch (RBC) was 444 t. The catch was 432.91 t, and the weighted average discards were 0.73 t. The catch and discards combined was 433.64 t, which is below the RBC of 444 t. The stock is therefore classified as **not subject to overfishing**.




Note: **TAC** Total allowable catch. Data for 2016 do not include discards and state catch.
Source: Haddon 2016a; Australian Fisheries Management Authority catch disposal records (2016 data)

**Figure 1** **Blue-eye Trevalla annual catches (CTS, SHS and states) and fishing season TACs, 1997 to 2016 (from Patterson et al. 2017).**

### Recreational and Indigenous

Recreational catches have not been accounted for in the Commonwealth assessment of Blue-eye Trevalla. Accounting for recreational catch has been raised as an issue for consideration in Commonwealth assessments (SESSF RAG 2017).

### Illegal Unregulated and Unreported

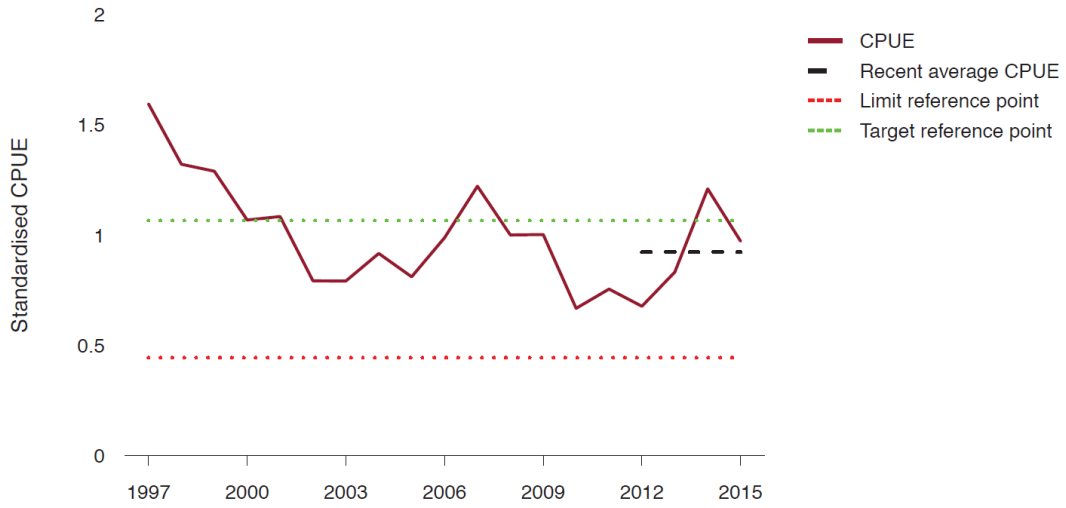
The level of Illegal Unregulated and Unreported (IUU) fishing has not been quantified.

## Catch rate information

Blue-eye Trevalla standardised CPUE analysis using data to 2015, from Haddon (2016), is presented in Figure 2 below (from Patterson et al. 2017).

Text below summarised from Paterson et al. (2017).

> The 2016 assessment indicates a decrease in CPUE from 2014 to 2015, although this decrease is within the 95 per cent confidence intervals of the mean estimates. Most of the catch is now caught by only a few vessels; consequently, the CPUE is currently more sensitive to changes in the fishing behaviour of these vessels. This is expected to increase the variance of the CPUE.
>
> The estimated 4-year average CPUE (2012–2015) is between the limit and the target (Figure 2), and the Blue-eye Trevalla stock is therefore classified as **not overfished**.




Note: **CPUE** Catch-per-unit-effort.
Source: Haddon 2016b

**Figure 2** **Standardised auto-longline and dropline CPUE index for Blue-eye Trevalla, 1997 to 2015 (Source: Haddon 2016, cited in Patterson et al. 2017).**

## Stock assessment method

| | |
|---|---|
| Year of most recent assessment | 2016 (Haddon 2016) |
| Assessment method | Commonwealth Tier 4, Standardised CPUE (including discards) |

| **Stock assessment method** | |
|---|---|
| Main data inputs | CPUE (Commonwealth Dropline (1997–2006) and Autoline (2002–2015); Zones 20–50; Depth 200–600)<br>Catch (total Blue-eye catch from the SESSF); Discard rates (Thomson and Upston 2016) |
| Main data inputs (rank)† | CPUE: 2 (medium quality) (Haddon 2016)<br>Catch and discard rates: 2 (medium quality) (Haddon 2016; Thomson and Upston 2016) |
| Key model structure and assumptions | Tier 4 – Standardised CPUE (Commonwealth harvest strategy policy); Commonwealth of Australia 2007, 2017<br>*Assumptions* (see Haddon 2016)*:* catch rate provides a relative index of abundance (not subject to hyper-stability or hyper-depletion and not unduly influenced by other factors not accounted for through standardisation); the reference period provides a good estimate of the stock when at a depletion level of $0.48B_0$; estimates of catch during the target period are accurate |
| Sources of uncertainty evaluated | Uncertainty associated with Tier 4 assessment (see Haddon 2016); factors considered in the CPUE standardisation: Year, Vessel, Month, Zone, Depth category and Month:Zone; investigation of additional zones (84 and 85); alternate CPUE i.e. catch per day; effect of Commonwealth fishery closures |

† Main data inputs (rank)

1 – High quality: data have been subjected to documented quality assurance and peer review processes, are considered representative and robust and provide a high level of confidence to support fisheries management decisions.

2 – Medium quality: data have been subjected to some internal quality assurance processes, have some documented limitations, but are still considered sufficiently accurate and informative to be useful to inform management decisions with some caveats.

3 – Low quality: data have been subjected to limited or no quality assurance processes, may be compromised by unknown or documented limitations that have not been fully explored, but are considered the best available information and require a high level of precaution to be exercised when interpreted to inform management decisions.

| **Status indicators and limits — reference levels** | |
|---|---|
| Biomass indicator or proxy | Standardised CPUE (AFMA 2017) |

| Status indicators and limits — reference levels | |
|---|---|
| Biomass limit reference level | Standardised CPUE (AFMA 2017 – proxy $0.2B_0$)<br>$0.2/0.48$ * $Cacth_{Target}$; $CPUE_{Target}$ (Ref Yr 1997–2006) (Haddon 2016) |
| Fishing mortality indicator or proxy | NA<br>Implied from Patterson et al. (2017).<br>Catch (including discards) as a proportion of RBC<br>Trend in CPUE |
| Fishing mortality limit reference level | Implied from Patterson et al. (2017).<br>Catch (plus discards) as a proportion of RBC is <1 |
| Target reference level | Standardised CPUE at $0.48B_0$ = $CPUE_{Target}$ (Ref Yr: 1997–2006) (Haddon 2016) |

| Stock assessment results | |
|---|---|
| Biomass status in relation to limit | Standardised CPUE (B proxy) is between the limit and the target (Patterson et al. 2017) |
| Fishing mortality in relation to limit | Not subject to overfishing (Patterson et al. 2017) |
| Previous SAFS stock status | 2016: **sustainable** (first year of SAFS assessment) |
| Current SAFS stock status | 2018 yet to be determined |

**Fishery interactions**

Interactions between the Commonwealth Trawl and Auto-longlining Fisheries are described by Sporcic and Haddon (2016), who associate declines in the trawl sector since the mid-2000s with increased catches in the auto-longlining sector.

Commonwealth fisheries interact with other commercial and non-commercial bycatch and discard marine species, a range of endangered threatened and/or protected species and marine habitats (AFMA 2014, Wayte et al. 2007).

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