

# Blue Threadfin (2023)

*Eleutheronema tetradactylum*



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## STOCK STATUS OVERVIEW

| Jurisdiction       | Stock                 | Stock status | Indicators                                      |
|--------------------|-----------------------|--------------|---|
| Western Australia  | Western Australia     | Negligible   | Catch   |
| Northern Territory | Northern Territory    | Sustainable  | Catch, estimated harvest rate                   |
| Queensland         | East Coast Queensland | Sustainable  | Catch, effort, nominal catch rate, risk profile |
| Queensland         | Gulf of Carpentaria   | Sustainable  | Catch, effort, nominal catch rate, risk profile |

## STOCK STRUCTURE

Blue Threadfin is widely distributed in coastal waters throughout the Indo-West Pacific. Its range extends from the Persian Gulf eastward around the Indian Ocean rim to the Malay Peninsula, Gulf of Thailand, mouth of the Mekong River delta, China, Taiwan Province, Philippines, through Indonesia to southern New Guinea and northern Australia and in the north to southern Japan [Carpenter and Niem 2001]. In Australia, Blue Threadfin extend from the Exmouth Gulf region in Western Australia around the northern coastline to Sandy Cape in southern Queensland [Carpenter and Niem 2001].

A number of methods (genetics, otolith stable isotope chemistry, parasite abundances, life history and tag-recapture data) have been used to examine population structure in the Blue Threadfin [Zischke et al. 2009; Welch et al. 2010; Horne et al. 2011; Moore et al. 2011; Newman et al. 2011; Ballagh et al. 2012; Horne et al. 2012; Horne et al. 2013]. These studies have shown that adult Blue Threadfin do not move very far and tend to form localised populations around northern Australia. A tagging study on Blue Threadfin on the east coast of

Australia found that approximately 70% of tagged Blue Threadfin were recaptured within 10 km of their release location [Zischke et al. 2009]. Blue Threadfin comprise numerous populations across northern Australia that are separated by 10 to 100 km or by large, coastal geographical features, and which exhibit high levels of self-recruitment [Zischke et al. 2009; Welch et al. 2010; Horne et al. 2011; Moore et al. 2011; Newman et al. 2011; Ballagh et al. 2012; Horne et al. 2012; Horne et al. 2013]. There is a high likelihood of separate biological stocks occurring within each jurisdiction; however, the boundaries between possible stocks and whether they might vary over time, are not known. The status of individual biological stocks cannot be determined as biological and catch-and-effort information are not collected at these finer spatial scales.

Here, assessment of stock status is presented at the management unit level in Queensland—Gulf of Carpentaria and East Coast Queensland, and at the jurisdictional level—Western Australia and Northern Territory.

## STOCK STATUS

**East Coast Queensland** Blue Threadfin is primarily harvested as a by-product species in the East Coast Inshore Fishery, with most of the catch taken by gillnets and occasionally by line. Commercial catch and nominal catch rates have decreased since November 2015 following the introduction of three net closure areas and the associated licence buy-back scheme. Average annual catch for the Net Free Zones prior to this management change (2006–07 to 2014–15) was 35 tonnes (t), 5 t and 3 t for the Capricorn Coast, Trinity Bay and St Helen’s respectively. This represents 27% of the catch of the entire east coast over this time period. Commercial catch rates increased abruptly from 1988–89 to 1994–95 peaking at 14 kg per 100 m of net. Rates stabilised at 9 to 12 kg per 100 m until 2015–16. Commercial catch rates remain above 50% of the long-term average at 7 to 8 kg per 100 m of net despite the closure of productive areas to commercial netting in late 2015. The above evidence indicates the biomass of the stock is unlikely to be depleted and that recruitment is unlikely to be impaired.

A 2021 Ecological Risk Assessment (ERA) of the East Coast Inshore Fishery assessed east coast Blue Threadfin as a precautionary medium risk [Pidd et al. 2021]. Blue Threadfin are not highly targeted, and their high genetic diversity of east coast stocks and life history plasticity may provide them with some resilience to fishing pressure [GBRMPA 2012]. Blue Threadfin has a low discard rate of 1 per cent or less but a low survival rate of 36.2% [Halliday et al. 2001]. There is variability between areas, but there is evidence that at the minimum legal size of 40 cm (32 cm Fork Length), less than 50% of fish will have become females [Welch et al. 2010]. Due to net mesh size, most east coast Blue Threadfin have a chance to breed as males and as females before they are fully susceptible to commercial fishing methods. Management changes in 2015 reduced fishing pressure by decreasing the number of licences and removing some additional productive areas from commercial net fishing. Fishing effort declined from an annual average of approximately 4,000 days prior to 2016 to 1,547 days in 2021–2022. Recreational catch estimates of 18 t in 2019–20 were similar to the 2010–11 survey [Teixeira et al. 2021]. 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 East Coast Queensland management unit is classified as a **sustainable stock**.

**Gulf of  
Carpentaria**

In the Queensland Gulf of Carpentaria, Blue Threadfin is harvested by the Gulf of Carpentaria Inshore Fishery (GOCIF). The commercial catch has been variable since the commencement of compulsory commercial reporting (1989). Catch peaks of over 90 t occurred in 1994–95, 1999–2000 and 2002–03 to 2004–05. In 2021–22, the commercial catch from the GOCIF was 63 t, which is above the previous 10 year catch average of 52 t. Nominal catch rates for this species fluctuated from 6 kg and 10 kg per 100 m of net over the last 20 years. In 2021–22 a catch rate of 0.12 kg per 100 m of net was reported, the second highest catch rate in the time series. The above evidence indicates that the biomass of this stock is unlikely to be depleted and that recruitment is unlikely to be impaired.

A 2021 Ecological Risk Assessment (ERA) assessed Gulf of Carpentaria Blue Threadfin as a precautionary medium risk [Walton et al. 2021]. Blue Threadfin are not highly targeted, due to lower market demand [Walton et al. 2021]. In Queensland Gulf of Carpentaria waters, some Blue Threadfin are mature females prior to attaining the minimum legal size of 40 cm (23 cm Fork Length), however the proportion is unknown. Available data varied widely between studies, in the broader geographic range sampled by Bibby et al. [1997] 50% were female at 54.3 cm, but 20.8 cm in the Love River studied by Welch et al [2010]. Due to the net mesh size, most have a chance to breed as males and as females before they are fully susceptible to commercial fishing methods. Fishing pressure has generally decreased over the recent decade. In the early 2000s fishing effort was high with almost 2,800 fishing days reported in 2002–03 and netting licences peaked at 82 in 2004–05. In 2021–22 effort reduced to 1,385 fishing days, with catch reported from 51 active net licences. Estimated recreational harvest for 2019–20 was 7 t, a reduction from the 2010–11 and 2013–14 estimates of 17 and 19 t respectively. 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 Queensland Gulf of Carpentaria management unit is classified as a **sustainable stock**.

**Northern  
Territory**

The recreational harvest in the Northern Territory is a significant portion of the overall harvest of this species, at around 40% [West et al. 2012]. The majority of the recreational take of Blue Threadfin (85%) is captured around the greater Darwin area, within a radius of about 150 km of this population centre [West et al. 2012]. The recreational catch within this region in 2015 was 5.2 t [Matthews et al. 2019]. The spatial distribution of the commercial catch is similar, with some harvest from the northeast coast and the southern Gulf of Carpentaria. There are no estimates of the Indigenous harvest of Blue Threadfin (as a unique species) in the Northern Territory. However, the annual harvest of 'Threadfin Salmons' (i.e. 8,565 individual fishes) reported by Henry and Lyle [2003] provides some indication of the scale of the combined harvest of Blue Threadfin and King Threadfin (*Polydactylus macrochir*) by Indigenous fishers in this jurisdiction.

The commercial catch of Blue Threadfin peaked at 26.9 t in 2011. Annual catches in the decade spanning 2010–19 averaged 13.6 t, with the catch in 2022 being 2.6 t. A preliminary assessment using catch data applied to a modified catch-MSY model (developed by Martell and Froese [2013] and modified by Haddon et al. [2018]), suggests that the relative biomass (29.5 t) of Blue Threadfin at in 2019 was above the target biomass (i.e. 50% of 1983 biomass) [Grubert and Saunders 2020]. Whilst there is a relatively high degree of

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uncertainty associated with estimates of depletion, harvest rate and MSY parameters using a catch-MSY approach, the species is not commercially targeted, and fishing effort has declined in recent years, which has been accompanied by a corresponding decline in commercial catches. The above evidence indicates that the biomass of this stock is unlikely to be depleted and that recruitment is unlikely to be impaired. The same assessment also indicated that the harvest rate in 2019 was just over half of the target rate. 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, Blue Threadfin in the Northern Territory is classified as a **sustainable stock**.

**Western  
Australia**

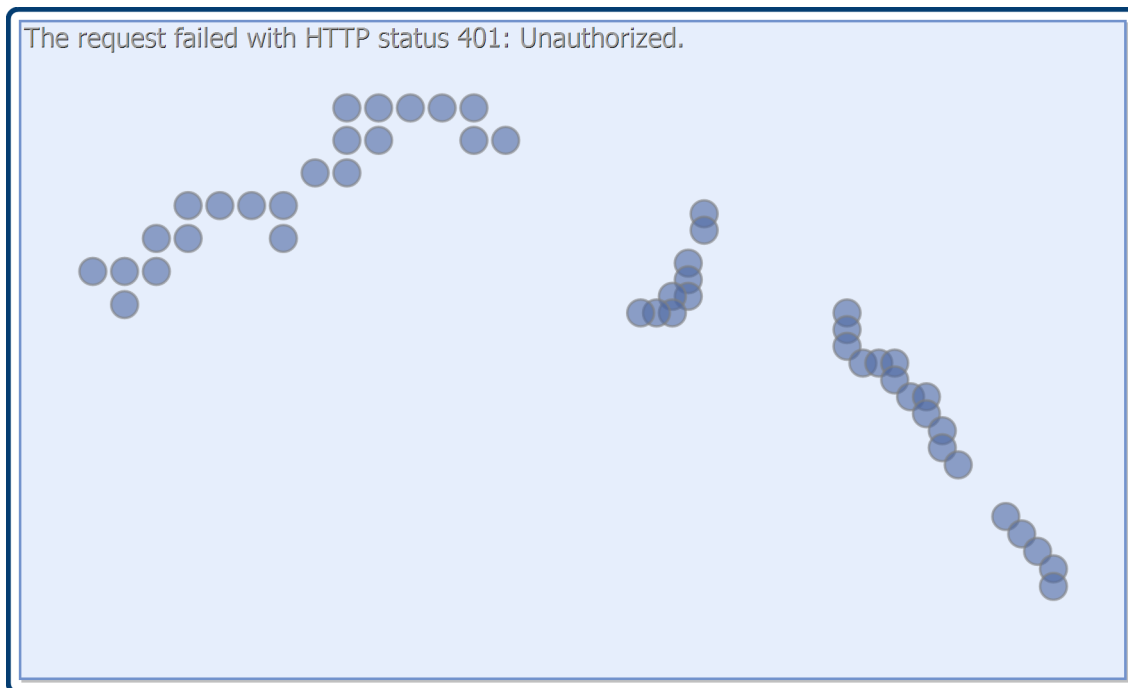
Stock status for the Western Australian jurisdictional stock is reported as **negligible** due to historically low levels of catch in this jurisdiction and the stock has generally not been subject to targeted fishing. Blue Threadfin is caught primarily within the North Coast Nearshore and Estuarine Resource (NCNER) by the Kimberley Gillnet and Barramundi Managed Fishery (KGBMF) in small quantities as by-product [Trinnie et al. 2023] when targeting Barramundi or King Threadfin. The stocks of Barramundi and King Threadfin are assessed as sustainable stocks in Western Australia. Consequently, the level of risk associated with the sustainability of Blue Threadfin in the NCNER is considered to be low. Catch levels of Blue Threadfin across the NCNER over the last 10 years (2013–22) have ranged from 3.8–6.3 t, with a mean annual catch of 5.5 t. This is a decline on the averages catches across the previous 10 years (9.1 t). In recent years, overall commercial fishing effort directed towards fish stocks in the NCNER has declined markedly. This reflects, at least in part, the removal of two commercial gillnet licenses in 2013 from the Broome coast area of the fishery [Newman et al. 2022], along with closures in the mid-2000s to commercial fishing along a large area of the Pilbara coast and Eighty-mile beach. This large area of the fishery, which is closed to commercial fishing, only experiences recreational, charter, and indigenous fishing. Catches of Blue Threadfin remain a minor component of recreational and charter landings throughout the North Coast Bioregion of WA. The combined recreational and charter catch of Blue Threadfin is larger than the commercial catch (on average approximately 75% of the total catch in past 10 years).

**BIOLOGY**

**Blue Threadfin biology** [Stanger 1974; Bibby et al. 1997; McPherson 1997; Pember 2006; Welch et al. 2010]

| Species        | Longevity / Maximum Size | Maturity (50 per cent)  |
|----------------|--------------------------|---|
| Blue Threadfin | 7 years, 880 mm FL       | Variable on location and year<br>Females: 2 to 4 years, 208–543 mm FL |

**DISTRIBUTION**



Distribution of reported commercial catch of Blue Threadfin

TABLES

| Fishing methods     | Northern Territory | Queensland | Western Australia |
|---------------------|--------------------|------------|-------------------|
| <b>Charter</b>      |                    |            |                   |
| Handline            |                    | ✓          |                   |
| Hook and Line       | ✓                  | ✓          | ✓                 |
| <b>Commercial</b>   |                    |            |                   |
| Gillnet             | ✓                  |            | ✓                 |
| Line                |                    | ✓          |                   |
| Net                 |                    | ✓          |                   |
| Unspecified         | ✓                  |            |                   |
| <b>Recreational</b> |                    |            |                   |
| Handline            | ✓                  | ✓          |                   |
| Hook and Line       | ✓                  | ✓          | ✓                 |
| Spearfishing        |                    | ✓          |                   |

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| Management Methods           |                    |            |                   |
|------------------------------|--------------------|------------|-------------------|
|                              | Northern Territory | Queensland | Western Australia |
| <b>Charter</b>               |                    |            |                   |
| Bag limits                   |                    |            | ✓                 |
| Bag/possession limits        |                    | ✓          |                   |
| Gear restrictions            | ✓                  | ✓          |                   |
| Limited entry                | ✓                  |            | ✓                 |
| Passenger restrictions       | ✓                  |            | ✓                 |
| Possession limit             | ✓                  |            |                   |
| Seasonal or spatial closures |                    | ✓          |                   |
| Size limits                  |                    | ✓          |                   |
| Spatial closures             | ✓                  |            | ✓                 |
| Spatial zoning               | ✓                  |            | ✓                 |
| Temporal closures            | ✓                  |            |                   |
| <b>Commercial</b>            |                    |            |                   |
| Gear restrictions            | ✓                  | ✓          | ✓                 |
| Harvest Strategy             |                    | ✓          |                   |
| Limited entry                | ✓                  | ✓          | ✓                 |
| Mesh size regulations        | ✓                  |            |                   |
| Seasonal or spatial closures |                    | ✓          |                   |
| Size limits                  |                    | ✓          |                   |
| Spatial closures             | ✓                  |            | ✓                 |
| Spatial zoning               | ✓                  |            | ✓                 |
| Temporal closures            | ✓                  |            |                   |
| Vessel restrictions          | ✓                  | ✓          | ✓                 |

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| Recreational                                     |   |   |   |
|--|---|---|---|
| Bag limits                                       |   |   | ✓ |
| Bag/possession limits                            |   | ✓ |   |
| Gear restrictions                                | ✓ | ✓ |   |
| Licence (Recreational Fishing from Boat License) |   |   | ✓ |
| Possession limit                                 | ✓ |   |   |
| Seasonal or spatial closures                     |   | ✓ |   |
| Size limits                                      |   | ✓ |   |
| Spatial closures                                 | ✓ |   | ✓ |
| Spatial zoning                                   | ✓ |   |   |
| Temporal closures                                | ✓ |   |   |

| Catch        |                    |  |                   |
|--------------|--------------------|--|-------------------|
|              | Northern Territory | Queensland   | Western Australia |
| Charter      | 1.2 t              |  | 1.44 t            |
| Commercial   | 3.0696 t           | 102.125 t  | 1.55187 t         |
| Indigenous   | Unknown            | Unknown  |                   |
| Recreational | 7.806 t            | 19 t +/- 9 t Gulf of Carpentaria,<br>15 t +/- 7 t East Coast | 2.28 t            |

**Northern Territory – Charter (management methods).** Note Charter operators in the Northern Territory are under the same management methods as the recreational sector but have the additional restrictions of limited licences and passenger numbers.

**Northern Territory - Indigenous (management methods).** The Fisheries Act 1988 (NT), specifies that: “Unless expressly provided otherwise, nothing in this Act derogates or limits the right of Aboriginal people who have traditionally used the resources of an area of land or water in a traditional manner to continue to use those resources in that area in that manner.”

**Northern Territory - Indigenous (Management Methods).** The Fisheries Act 1988 (NT), specifies that: “Unless expressly provided otherwise, nothing in this Act derogates or limits the right of Aboriginal people who have traditionally used the resources of an area of land or water in a traditional manner to continue to use those resources in that area in that manner.”

**Queensland – Indigenous (Management Methods).** For more information see: <https://www.daf.qld.gov.au/business-priorities/fisheries/traditional-fishing>

**Queensland – Commercial (Catch).** Queensland commercial and charter data have been sourced from the commercial fisheries logbook program. Further information available through the Queensland Fisheries Summary Report <https://www.daf.qld.gov.au/business-priorities/fisheries/monitoring-research/data/queensland-fisheries-summary-report>

**Queensland – Recreational Fishing (Catch).** Data are based at the whole of Queensland level and derived from statewide recreational fishing surveys. Where possible, estimates have been converted to weight (tonnes) using best known conversion multipliers. Conversion factors may display regional or temporal variability. In the absence of an adequate conversion factor, data are presented as number of fish.

**Western Australia – Recreational (Catch).** Boat-based recreational catch between 1 September 2020 and 31 August 2021 from Ryan et al. [2022]. Please note that catches of Blue Threadfin are underestimates as shore-based and boat-based fishers that only operated in freshwater were out of scope of the survey.

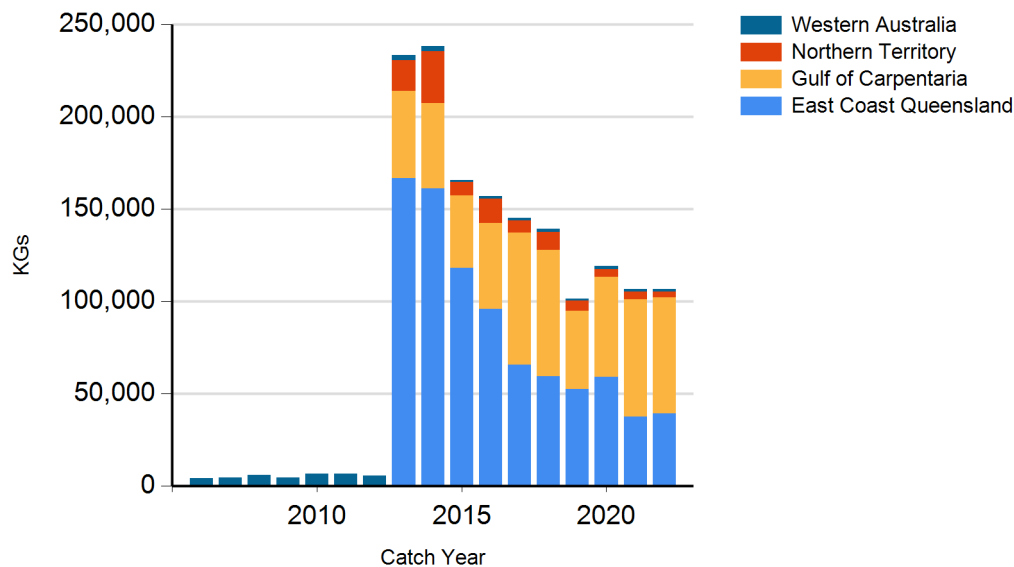
**Western Australia – Recreational (Management Methods).** A Recreational Fishing from Boat Licence is required for the use of a powered boat to fish or to transport catch or fishing gear to or from a land-based fishing location.

**Western Australia – Indigenous (Management Methods).** Subject to application of Section 211 of the *Native Title Act 1993* (Cth), and the exemption from a requirement to hold a recreational fishing licence, the non-commercial take by Indigenous fishers is covered by the same arrangements as that for recreational fishing.

## CATCH CHART



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Commercial catch of Blue Threadfin - note confidential catch not shown.

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