

Bronze Whaler (2020)

Carcharhinus brachyurus



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STOCK STATUS OVERVIEW

| Jurisdiction | Stock | Stock status | Indicators |
|---|--------------------|--------------|-----------------|
| Commonwealth, Western Australia, Queensland, New South Wales, Victoria, South Australia | Southern Australia | Undefined | Catch and CPUE. |

STOCK STRUCTURE

South Australia approximates the centre of the Australian distribution of the Bronze Whaler (*Carcharhinus brachyurus*) [Last and Stevens 2009]. The Bronze Whaler is highly mobile, seasonally migratory and has a cosmopolitan warm-temperate distribution [Last and Stevens 2009]. Adult and juvenile sharks inhabit coastal and shelf waters of the west, south and north coasts of Australia between approximately Coffs Harbour in New South Wales (though with some sharks entering Queensland waters) and Geraldton in Western Australia. Information on the genetic structure of the population suggests that the Indian Ocean is a geographical barrier to gene flow between Australia and South Africa [Benavides et al. 2011]. Within Australian waters, genetic analyses indicate there is a well-mixed stock ranging between western, southern and eastern Australia. Analyses using single-nucleotide polymorphisms (SNPs) provided some support for a potential separation of Western Australia from the rest of Australia and New Zealand (based on neutral loci only), however, this was only based on two (Augusta, Western Australia) of 103 samples [Junge et al. 2019], and hence, should be treated cautiously. Movement processes underlying the preliminary stock structure hypothesis (panmixia) have been studied using telemetry techniques at a range of spatial and temporal scales. The South Australian gulfs form important seasonal foraging habitats in spring-summer [Rogers et al. 2012], with juveniles and adults [Rogers et al. 2013; Drew et al. 2019] moving out of both Spencer Gulf [Rogers and Drew 2018] and Gulf St Vincent during autumn [Drew et al. 2017]. Long-distance migrations were documented between South Australia and Western Australia [SARDI unpublished data, WA DPIRD unpublished data], and southern and eastern Victoria [Rogers et al. 2013]. Movement data collected in Western Australian waters indicates strong seasonality in the species' presence in that jurisdiction, and, for some individuals, residency between July and January [McAuley et al. 2016]. Evidence supporting seasonal use of Western Australian waters includes detections there of some sharks originally tagged in South Australia.

Based on available evidence including seasonal catch and tagging patterns, genetic population structure, and movement patterns determined from conventional and electronic telemetry, Bronze Whaler is assessed here as a single biological stock spanning South Australia, Victoria, New South Wales, southern Queensland at the species range limits, and WA. Additionally, Bronze Whaler inhabits Commonwealth waters adjacent to these jurisdictions).

STOCK STATUS

Southern Australia Most of the undifferentiated whaler shark catch is harvested in South Australia by fishers in the commercial multi-species, multi-gear and multi-sectoral Marine Scalefish Fishery (MSF) [Steer et al. 2020]. The main gear-type used is longlines (77 per cent), although other gear types including droplines and handlines are also used. Fishery logbook data do not resolve catches of Bronze Whaler and Dusky Shark to the level of species. This lack of resolution at the species level is the main source of uncertainty hampering formal stock assessment for Bronze Whaler [Steer et al. 2020]. Short-term, onboard fishery sampling programs found the mixed whaler shark catches in the MSF were predominantly comprised of Bronze Whalers (80–96 per cent), with Dusky Shark making up the remainder of observed catches [Rogers et al. 2013; Drew et al. 2017]. Annual total catches range from 45 to 155 t, with an average of 82 t/year between 1999–00 and 2018–19.

Information on the recreational take of whaler sharks (assumed to be mostly Bronze Whaler) is limited to nominal catch data. On average, 723 whaler sharks were taken per year during the most recent survey (conducted during 2013–14), all of which were released [Giri and Hall 2015]. The South Australian Charter Boat Fishery reported harvesting <40 whaler sharks per year for an overall total of 194 between 2007–08 and 2018–19. There were no data available on the Indigenous catch, although anecdotal evidence suggests small numbers are taken annually from the shore for subsistence purposes.

Among Commonwealth fisheries, Bronze Whalers are predominately taken in sectors of the Southern and Eastern Scalefish and Shark Fishery (SESSF), with catch also reported in the Eastern Tuna and Billfish Fishery (ETBF) and the Western Tuna and Billfish Fishery (WTBF). Average annual catches for the combined Commonwealth fisheries are <30 t per year. Overall, these low catch levels constitute a relatively small proportion of the total annual catch taken from the Southern Australia stock.

In WA, Bronze Whalers are predominately taken in the Temperate Demersal Gillnet and Demersal Longline Fisheries. The main shark species captured in these fisheries are Gummy Shark, Dusky Shark, Whiskery Shark and Sandbar Sharks. Bronze Whalers constitute only a minor component of the catch. Species-specific records of Bronze Whaler are available since 1998, averaging 40 t per year for the last 10 years. The recreational catch level is negligible [Ryan et al 2019].

Bronze Whaler catches in New South Wales fisheries have consistently been below 22 t since 2009 when new species-specific logbook reporting was initiated. During the past six years, the catch has been <16 t, with the reported catch for 2019–20 being 13 t. The recreational catch is negligible [Murphy et al 2020]. There is no knowledge on levels of Indigenous harvest, however it is also likely to be negligible. Overall, these low catch levels constitute a small proportion of the total annual catch taken from the broader Southern Australia stock.

In Queensland, the Bronze Whaler is at the north-eastern end of its distribution, with catches occurring from Moreton Bay to the New South Wales border. The reported commercial harvest of Bronze Whalers taken by Queensland-managed fisheries averaged less than 300 kg per year since 1996, with no harvest

reported for eight of those years [QFISH 2020]. There are no reliable reports of recreational catch of Bronze Whaler in Queensland although with current management restrictions, harvest levels are assumed to be small. Overall, these low catch levels constitute a negligible proportion of the total annual catch taken from the Southern Australia stock.

Victoria’s low catch levels constitute a very small proportion of the total annual catch (0.5 per cent of national landings during the past decade) taken from the stock. The catch taken by Victorian-managed fisheries over the past two decades has totalled 14 t. At least one third of the catch is taken as by-catch.

There is no published stock assessment for the Southern Australia Bronze Whaler stock. In South Australia, population productivity and susceptibility to different harvest fractions was determined by Bradshaw et al. (2018) using Leslie matrix models. However, these models do not include catches from all sectors or jurisdictions, nor do they provide enough information to estimate biomass or exploitation rates. In addition, there is no knowledge of recruitment. This prevents assessment of current stock size or fishing pressure. Consequently, there is insufficient information available to confidently classify the status of this stock.

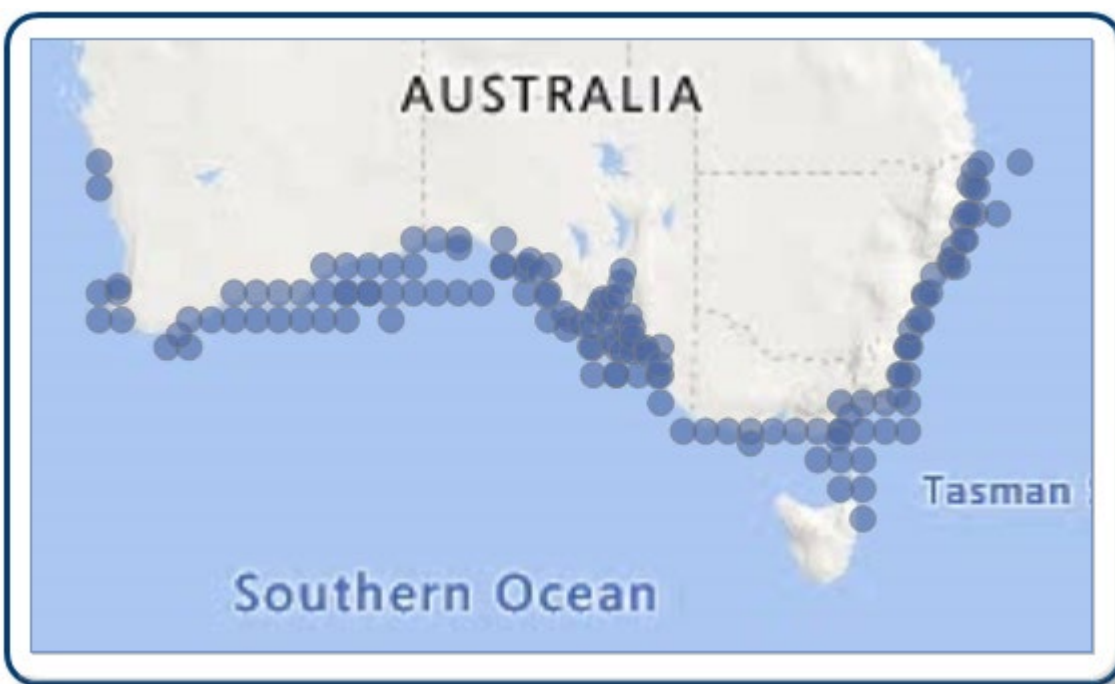
On the basis of the evidence provided above, the Southern Australia biological stock is classified as an **undefined stock**.

BIOLOGY

Bronze Whaler biology [Drew et al. 2017]

| Species | Longevity / Maximum Size | Maturity (50 per cent) |
|---------------|--|--|
| Bronze Whaler | South Australia. Females = 31 yrs; Males = 25 yrs. | South Australia. Females = 16 yrs; Males = 16 yrs. |

DISTRIBUTION



Distribution of reported commercial catch of Bronze Whaler

TABLES

| Fishing methods | Commonwealth | New South Wales | Queensland | South Australia | Victoria | Western Australia |
|------------------------|---------------------|------------------------|-------------------|------------------------|-----------------|--------------------------|
| Charter | | | | | | |
| Hook and Line | | | | | | ✓ |
| Line | | | ✓ | | | |
| Commercial | | | | | | |
| Danish Seine | ✓ | | | | | |
| Demersal Gillnet | ✓ | | | | | |
| Demersal Longline | ✓ | | | | | |
| Dropline | | | | ✓ | | |
| Gillnet | | | | | | ✓ |
| Handline | | | | ✓ | | |
| Hook and Line | | | | | ✓ | |
| Longline (Unspecified) | | | | | | ✓ |
| Mesh Net | | ✓ | | | | |
| Net | | | | | ✓ | |
| Otter Trawl | ✓ | ✓ | | | | |
| Pelagic Longline | ✓ | | | | | |
| Set longline | | | | ✓ | | |
| Unspecified | | | | ✓ | | |
| Various | | ✓ | ✓ | | | |
| Recreational | | | | | | |
| Hook and Line | | ✓ | | | | ✓ |
| Line | | | ✓ | | | |

| Management Methods | New South Wales | Queensland | South Australia | Western Australia |
|-----------------------------|------------------------|-------------------|------------------------|--------------------------|
| Charter | | | | |
| Bag and boat limits | | | ✓ | |
| Bag limits | | | | ✓ |
| Charter licensing | | | ✓ | |
| Licence (boat-based sector) | | | | ✓ |

| | | | | |
|--|---|---|---|---|
| Limited entry (Charter only) | | | ✓ | |
| Possession limit | | ✓ | | |
| Size limit | | ✓ | | ✓ |
| Spatial closures | | | | ✓ |
| Commercial | | | | |
| Effort limits | ✓ | | | |
| Effort limits (individual transferable effort) | | | | ✓ |
| Fishing gear and method restrictions | | | ✓ | |
| Gear restrictions | ✓ | ✓ | | ✓ |
| Gillnet restrictions | | | ✓ | |
| License | | | ✓ | |
| Limited entry | ✓ | ✓ | | ✓ |
| Limited entry (licensing) | | | ✓ | |
| Possession limit | | ✓ | | |
| Processing restrictions | ✓ | | | ✓ |
| Size limit | | ✓ | | ✓ |
| Spatial closures | ✓ | | | ✓ |
| Total allowable catch | | ✓ | | |
| Recreational | | | | |
| Bag and boat limits | | | ✓ | |
| Bag limits | ✓ | | | ✓ |
| Gear restrictions | ✓ | | | ✓ |
| Licence (boat-based sector) | | | | ✓ |
| Possession limit | | ✓ | | |
| Size limit | | ✓ | | ✓ |
| Spatial closures | | | | ✓ |

| Catch | Commonwealth | New South Wales | Queensland | South Australia | Victoria | Western Australia |
|---------------------|--------------|-----------------|------------|-----------------|----------|---|
| Charter | | | Unknown | | | Negligible |
| Commercial | 24.3109 t | 11.6706 t | 0.012 t | 50.3469 t | 0 t | 38.9292 t |
| Indigenous | | | Unknown | | | Unknown but likely to be negligible (Henry & Lyle 2003) |
| Recreational | | | Unknown | | | 1,457 individuals caught in 2017–18 (of which, 428 were kept, Ryan et al 2019). Shore-based catches are unknown |

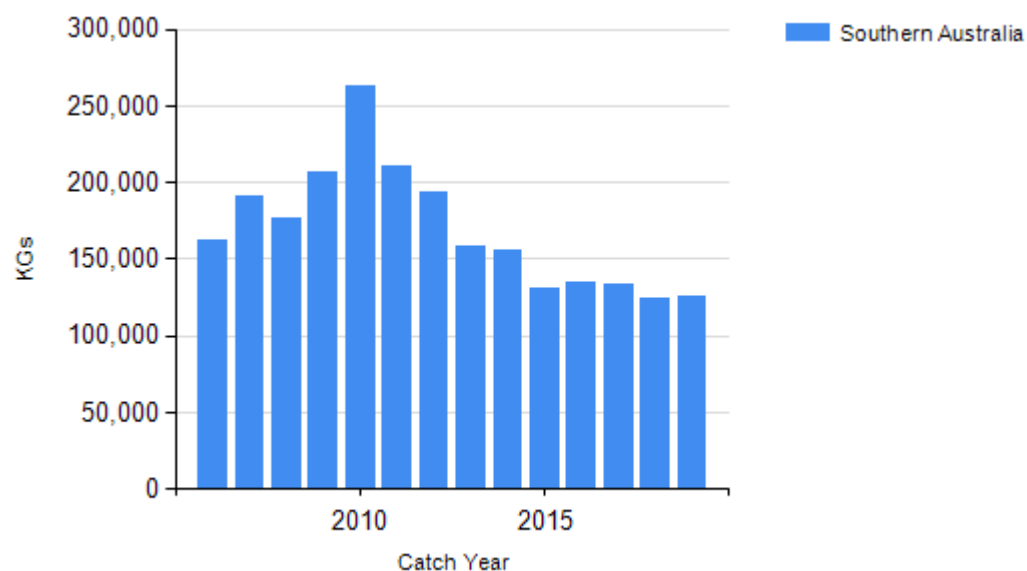
Western Australia – Recreational (Management methods) A recreational fishing from boat licence is required for recreational fishing from a powered vessel in Western Australia.

Queensland – Indigenous (management methods) for more information see <https://www.daf.qld.gov.au/business-priorities/fisheries/traditional-fishing>

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

New South Wales commercial fisheries with less than seven active fishers are not presented due to the Privacy Act.

CATCH CHART



Commercial catch of Bronze Whaler - note confidential catch not shown

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