

Dusky Whaler (2018)

Carcharhinus obscurus



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STOCK STATUS OVERVIEW

Jurisdiction	Stock	Fisheries	Stock status	Indicators
Commonwealth, New South Wales	Eastern Australia	ETBF, N/A, OTF, OTLF, SPF	Undefined	Catch
Commonwealth, Western Australia, South Australia	Western Australia	JASDGLMF, JASDGLMF WCDGLIMF, MSF, SESSF (GHTS), WCDGLIMF	Recovering	Catch, CPUE, direct estimates of fishing mortality, demographic analysis, risk assessment

ETBF Eastern Tuna and Billfish Fishery (CTH), SESSF (GHTS) Southern and Eastern Scalefish and Shark Fishery (Gillnet Hook and Trap Sector) (CTH), SPF Small Pelagic Fishery (CTH), N/A Not Applicable (NSW), OTF Ocean Trawl Fishery (NSW), OTLF Ocean Trap and Line Fishery (NSW), MSF Marine Scalefish Fishery (SA), JASDGLMF Joint Authority Southern Demersal Gillnet and Demersal Longline Managed Fishery (Zone 1 & Zone 2) (WA), WCDGLIMF West Coast Demersal Gillnet and Demersal Longline (Interim) Managed Fishery (WA), JASDGLMF || WCDGLIMF Various Fisheries combined due to 3 boat rule (WA)

STOCK STRUCTURE

Dusky Shark has a tropical to warm-temperate distribution and is found off the west, south and north coasts of Australia, mostly between latitude 18°S and 36°S [McAuley et al. 2007, Rogers et al. 2013a], and off the east coast, where the range of the species is currently undefined. Electronic and conventional tagging studies have shown Dusky Sharks move between South Australia and Western Australia [Huvneers et al. 2014, Rogers et al. 2013b, Simpfendorfer et al. 1999], and genetic analyses suggest there is restricted gene flow between Dusky Shark off eastern and western Australia [Geraghty et al. 2014]. Therefore, Dusky Shark in South Australian and Western Australian waters are considered to form a single biological stock (the Western Australia stock). This biological stock exhibits a high degree of ontogenetic segregation, with juveniles most common in temperate latitudes and adults in warmer northern latitudes [McAuley et al. 2007, McAuley et al. 2015].

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

STOCK STATUS

Eastern Australia

Dusky Shark is taken as a non-target species by Commonwealth fishers in the Eastern Tuna and Billfish Fishery (ETBF). Biological stock status has not been assessed in the ETBF, but the species has been considered using ecological risk assessment methods and found to be at medium risk [AFMA 2018]. Catches in the ETBF have averaged around 2.3 tonnes (t) over the last 10 years. The species is also taken in the Gillnet Hook and Trap Sector (GHTS) of the Southern and Eastern Scalefish and Shark Fishery (SESSF), with catches averaging around 1.7 t over the last eight years.

In Queensland, species-specific reporting of Dusky Sharks only commenced in 2009 and only for a sub-component of the Queensland East Coast Inshore Net Fishery. The reported harvest since this time has averaged about 2 t per year.

In New South Wales, Dusky Shark, was not identified and reported at the species level in commercial catch logbooks until 2009. Observer data indicate that whaler sharks represent the second highest shark species catch in the New South Wales Ocean Trap and Line Fishery (15 per cent of overall catch) [Macbeth et al. 2009]. During the period under consideration, around 1.88 t of Dusky Shark was landed in New South Wales. A catch of around 1 t was reported by the New South Wales Shark Meshing Program. Insufficient information is currently available to determine status for any of the whaler shark species in New South Wales, including Dusky Shark [Rowling et al. 2010].

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

Western Australia

The cross-jurisdictional Western Australia Dusky Shark stock has components in waters of the Commonwealth, Western Australia and South Australia. This biological stock is most abundant in waters between north-west and southern Western Australia (to longitude 120°E). The carcharhinid species composition in the South Australian State-managed commercial Marine Scalefish Fishery (MSF) is not resolved in log-books. Onboard sampling showed carcharhinid catches by the MSF largely comprised juvenile Bronze Whalers (*C. brachyurus*), with juvenile Dusky Sharks (900–3 000 mm total length) representing < 10 per cent of landings [Rogers et al. 2013a, SARDI unpublished data]. Hence, no catch data are provided in this assessment year. Presence of Dusky Shark in catches in South Australian waters is seasonally and spatially variable [Jones 2008, Rogers et al. 2013a]. Given that this stock's primary distribution is off the south-west coast and that Western Australian catches have historically been several times higher than those in the other jurisdictions, the status of this biological stock is largely determined from the Western Australia stock assessment.

Catches of Dusky Shark in Western Australia's Joint Authority Southern Demersal Gillnet and Demersal Longline Managed Fishery, and the West Coast Demersal Gillnet and Demersal Longline Fishery have historically consisted of neonate (young of the year) and one–two year old sharks. Collectively, these age classes accounted for 89 per cent of the observed catch during the 1990s [McAuley and Simpfendorfer 2003, Simpfendorfer et al. 2002]. The status of this stock has been assessed using demographic modelling techniques, fishing mortality rates estimated from a tagging study in the 1990s, and contemporary catch and catch per unit effort (C/PUE) data [McAuley et al. 2007, Simpfendorfer 2010]. The most recent assessment in 2005 confirmed that recorded catches of young juvenile sharks in the target fisheries have been sustainable since the mid-1990s. However, the assessment model also predicted that very low levels of fishing mortality (1–2 per cent per year) applied to sharks older than 10 years would result in recruitment overfishing [McAuley et al. 2007]. Previous assessments therefore concluded that the declining trend observed in the effective Dusky Shark CPUE series between the mid-1990s and 2004–05 indicated that breeding biomass had been gradually depleted by low, but poorly quantified, levels of

extraneous fishing mortality, including fisheries operating in other jurisdictions [Marshall et al. 2016, McAuley et al. 2015, Jones 2008, Rogers et al. 2013a]. The above evidence indicates that this stock was likely to be depleted and recruitment impaired. As a result, comprehensive measures to mitigate cryptic mortality of older Dusky Sharks within all Western Australian managed commercial fisheries, and to reduce catches of juveniles to below the levels determined to be sustainable in the mid-1990s, have been introduced since 2006–07. An increasing trend in the effective CPUE from 2006–12, suggests improved recruitment rates and a recovering stock [McAuley et al. 2015], indicating that current management arrangements are suitably precautionary to ensure that the biological stock continues to recover [McAuley et al. 2015].

Recently, a stock assessment was conducted based on a risk-based weight of evidence approach using all available lines of evidence, including simulated biomass trajectories derived from a combination of demographic modelling and catch-only stock reduction analysis [Braccini et al. in prep.]. This assessment estimated a “Medium” current risk level for the Dusky Shark stock, with 46 per cent, 73 per cent and 100 per cent of the simulated current (2015–16) relative total biomass trajectories being above the target, threshold and limit biomass reference points, respectively [Braccini et al. in prep.].

The above evidence indicates that the current level of fishing mortality should allow the stock to recover from its recruitment impaired state.

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

BIOLOGY

Dusky Shark biology [Geraghty et al. 2013, McAuley et al. 2007, Simpfendorfer et al. 2002]

Species	Longevity / Maximum Size	Maturity (50 per cent)
Dusky Whaler	Females > 40 years, 2 890 mm FL Males > 32 years, 3 560 mm TL (~2 920 mm FL)	Females 27–35 years, 2 540 mm FL

DISTRIBUTION



Distribution of reported commercial catch of Dusky Shark

TABLES

Commercial Catch Methods	Commonwealth	New South Wales	South Australia	Western Australia
Demersal Gillnet	✓			
Demersal Longline	✓	✓		
Dropline	✓			
Gillnet				✓
Longline (Unspecified)				✓
Midwater Trawl	✓			
Otter Trawl		✓		
Pelagic Longline	✓			
Rod and reel	✓			
Setline		✓		
Unspecified		✓	✓	✓

Fishing methods	Commonwealth	New South Wales	South Australia	Western Australia
Commercial				
Demersal Gillnet	✓			
Demersal Longline		✓		
Gillnet				✓
Longline (Unspecified)				✓
Midwater Trawl	✓			
Otter Trawl		✓		
Pelagic Longline	✓			
Setline		✓		
Unspecified		✓	✓	✓
Recreational				
Hook and Line		✓	✓	✓

Management Methods	New South Wales	South Australia	Western Australia
Commercial			
Effort limits		✓	✓

Gear restrictions	✓	✓	✓
Limited entry	✓	✓	✓
Maximum size limit			✓
Possession limit			✓
Processing restrictions		✓	✓
Spatial closures	✓	✓	✓
Indigenous			
Bag limits	✓	✓	
Gear restrictions		✓	
Native Title	✓		
Section 37 (1d)(3)(9), Aboriginal cultural fishing authority	✓		
Recreational			
Bag and possession limits			✓
Bag limits	✓	✓	✓
Gear restrictions		✓	
Licence			✓
Size limit			✓
Spatial closures			✓

Active Vessels	Commonwealth	New South Wales	South Australia	Western Australia
	26 Vessels in ETBF, 1 Vessels in SESSF (GHTS), 1 Vessels in SPF, 2 Vessels in WTBF,	8 Fishing Business in OTLF,	103 in MSF, 0 Licences in MSF,	14 in JASDGLMF, 5 in WCDGDLIMF,

ETBF Eastern Tuna and Billfish Fishery(CTH)

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

SPF Small Pelagic Fishery(CTH)

WTBF Western Tuna Billfish Fishery(CTH)

OTLF Ocean Trap and Line Fishery(NSW)

MSF Marine Scalefish Fishery(SA)

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

WCDGDLIMF West Coast Demersal Gillnet and Demersal Longline (Interim) Managed Fishery(WA)

Catch	Commonwealth	New South Wales	South Australia	Western Australia
Commercial	2.298t in ETBF, 0.09t in SESSF (GHTS), 0.16t in SPF,	1.059t in N/A,		153.621t in JASDGLIMF WCDGDLIMF,
Indigenous	Unknown	Unknown	Unknown	Undetermined but likely to be negligible
Recreational	Unknown	Shore-based catches are undetermined but consist primarily of juveniles	Undetermined but likely to be negligible	<10 t of whaler sharks caught from boats is retained, shore-based catches are undetermined

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Commercial (catch) Western Australian (state) and Eastern Australia biological stock is for Dusky Shark only. However, South Australian catches are reported as undifferentiated whaler sharks and are therefore not presented.

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.

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.

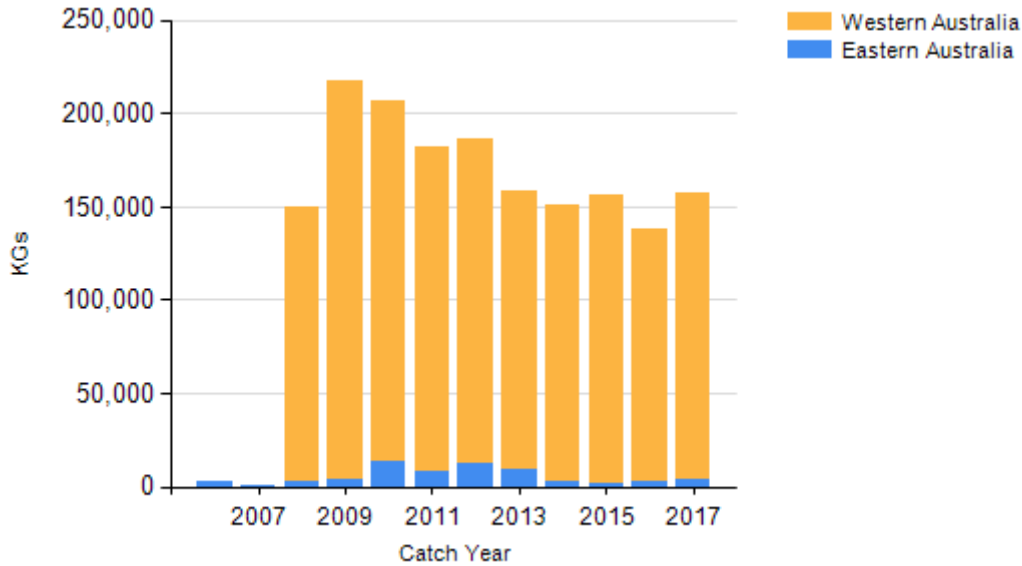
Western Australia – Recreational (Management Methods) A recreational fishing from boat licence is required for recreational fishing from a powered vessel in Western Australia.

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

New South Wales – Commercial (catch) For the Ocean Trap and Line Fishery (New South Wales), only one business reported sufficient catch to suggest targeting.

New South Wales – Indigenous (Management Methods) (a) 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 for themselves; (b) 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 (1d)(3)(9), Aboriginal cultural fishing authority; and (c) In cases where the *Native Title Act 1993* (Cth) applies fishing activity can be undertaken by the person holding native title in line with S.211 of that Act, which provides for fishing activities for the purpose of satisfying their personal, domestic or non-commercial communal needs. In managing the resource where native title has been formally recognised, the native title holders are engaged with to ensure their native title rights are respected and inform management of the State's fisheries resources.

CATCH CHART



Commercial catches of Dusky Shark - note confidential catch not shown

EFFECTS OF FISHING ON THE MARINE ENVIRONMENT

ENVIRONMENTAL EFFECTS on Dusky Whaler

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