

Dusky Whaler (2016)

Carcharhinus obscurus



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STOCK STATUS OVERVIEW

Jurisdiction	Stock	Fisheries	Stock status	Indicators
Commonwealth, New South Wales	Eastern Australia	ETBF, OTF, OTLF	Undefined	Catch
Commonwealth, Western Australia, South Australia	Western Australia	JASDGLMF, MSF, SESSF (GHTS), WCDGLIMF	Transitional-recovering	Catch, CPUE, direct estimates of fishing mortality

ETBF Eastern Tuna and Billfish Fishery (CTH), SESSF (GHTS) Southern and Eastern Scalefish and Shark Fishery (Gillnet Hook and Trap Sector) (CTH), OTF Ocean Trawl Fishery (NSW), OTLF Ocean Trap and Line (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)

STOCK STRUCTURE

Dusky Shark occurs off the west, south and north coasts of Australia, mostly between latitude 18°S and 36°S[1,2], and off the east coast, where the range of the species is currently undefined. Tagging studies have demonstrated Dusky Shark movements between the South Australian gulfs and Western Australian shelf and slope habitats[3,4], and genetic analysis suggests restricted gene flow between Dusky Shark off eastern and western Australia[5]. Therefore, Dusky Shark in South Australian and Western Australian waters are considered to form a single biological stock (the Western Australian stock). This biological stock exhibits a high degree of ontogenetic segregation, with juveniles most common in temperate latitudes and adults in warmer northern latitudes[1,6]. Because of negligible recorded catches in Victoria and Tasmania and comparatively small catches in Queensland and the Northern Territory, the Western Australian biological stock is believed to be separated from the east coast biological stock (the Eastern Australian stock).

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

STOCK STATUS

**Eastern
Australia**

Dusky Shark is taken as a non-target species by Commonwealth fishers in the Eastern Tuna and Billfish Fishery, but has not had its biological stock status assessed. Occasional, very small catches (200 kg or less) of Dusky Shark have also been reported from the Commonwealth Coral Sea Fishery. There is insufficient information available to confidently classify the status of this stock.

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 tonnes (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)[12]. During the period under consideration, around 1.8 t of Dusky Shark was landed in New South Wales. A similarly negligible, around 1 t was landed 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[13].

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

**Western
Australia**

The cross-jurisdictional Western Australian Dusky Shark stock has components in 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 catch composition in the South Australian state-managed Marine Scalefish Fishery is largely comprised of juvenile Bronze Whalers (*C. brachyurus*), with juvenile Dusky Sharks (900–3000 mm total length) representing less than 10 per cent of the catch. Its abundance in South Australian waters is seasonally and spatially variable[2,7]. 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 determined from the Western Australian stock assessment.

Catches of Dusky Shark in the 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 1–2 year old sharks. Collectively, these age classes accounted for 89 per cent of the observed catch during the 1990s[8,9]. 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 (CPUE) data[1,10]. 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 model also predicted that very low levels of fishing mortality (one–two per cent per year) applied to sharks older than 10 years would result in recruitment overfishing[1].

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[2,6,7,11]. The above evidence indicates that this stock was likely to be subjected to overfishing. 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[6], suggesting current management arrangements are suitably precautionary to ensure that the biological stock continues to recover[6].

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

BIOLOGY

Dusky Shark biology[1,9,14]

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

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			✓	
Hand Line, Hand Reel or Powered Reels	✓	✓	✓	
Haul Seine			✓	
Mesh Net		✓		
Otter Trawl		✓		
Pelagic Longline	✓		✓	
Setline		✓		
Unspecified			✓	
Various				✓

Fishing methods	Commonwealth	New South Wales	South Australia	Western Australia
Commercial				
Demersal Gillnet	✓			
Demersal Longline	✓			
Dropline			✓	
Gillnet			✓	
Hand Line, Hand Reel or Powered Reels		✓	✓	
Haul Seine			✓	
Mesh Net		✓		
Otter Trawl		✓		
Pelagic Longline	✓		✓	
Setline		✓		
Unspecified			✓	
Various				✓
Recreational				
Hand Line, Hand Reel or Powered Reels		✓	✓	✓

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	✓		
Section 31 (1)(c1), Aboriginal cultural fishing authority	✓		
Recreational			
Bag limits	✓		✓
Gear restrictions	✓	✓	
Size limit			✓

Active Vessels	Commonwealth	New South Wales	Northern Territory	South Australia	Western Australia
	24 License in ETBF, 0 Vessel in CSF, 2 Vessel in SESSF (GHTS), 0 Vessel in WTBF,	217 Vessel in OTLF,	0 Vessel in ONLF,	96 Vessel in MSF,	21 Vessel in JASDGLMF, 5 Vessel in WCDGLIMF,

CSF Coral Sea Fishery(CTH)

ETBF Eastern Tuna and Billfish Fishery(CTH)

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

WTBF Western Tuna Billfish Fishery(CTH)

OTLF Ocean Trap and Line(NSW)

ONLF Offshore Net and Line Fishery(NT)

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)

Catch				
	Commonwealth	New South Wales	South Australia	Western Australia
Commercial	0.407t in ETBF, 0.341t in SESSF (GHTS),	0.6292t in OTF, 0.4925t in OTLF,		124.096t in JASDGLMF, 29.4646t in WCDGLIMF,
Recreational		Shore-based catches are undetermined but consist primarily of juveniles	Undetermined	< 10 t of whaler sharks caught from boats is retained, shore-based catches are undetermined

ETBF Eastern Tuna and Billfish Fishery (CTH), SESSF (GHTS) Southern and Eastern Scalefish and Shark Fishery (Gillnet Hook and Trap Sector) (CTH), OTF Ocean Trawl Fishery (NSW), OTLF Ocean Trap and Line (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),

a 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.

b 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.

c New South Wales – Indigenous (management methods) Aboriginal Cultural Fishing Interim Access Arrangement - allows an Aboriginal 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.

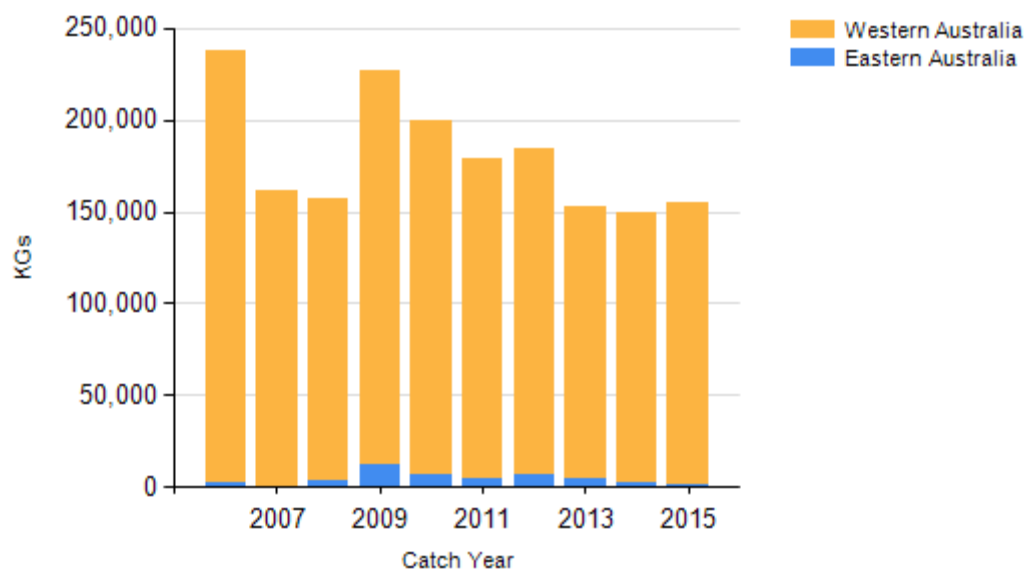
d New South Wales – Indigenous (management methods) Aboriginal Cultural Fishing Interim Access Arrangement - allows an Aboriginal fisher in New South Wales to take in excess of a recreational bag limit in certain circumstances, for example, if they are doing so to provide fish to other community members who cannot harvest themselves.

e Indigenous (management methods) Aboriginal Subject to the defence that applies under Section 211 of the Native Title Act 1993 (Cth), and the exemption to hold a recreational fishing licence, the non-commercial take by indigenous fishers is covered by the same arrangements as that for recreational fishing.

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

g Commercial (catch) Western Australian (state) and Eastern Australian biological stock is for Dusky Shark only. However, South Australian catches are reported as undifferentiated whaler sharks and are therefore not presented in Table 3 or Figure 2.

CATCH CHART



Commercial catches of Dusky Shark - note confidential catch not shown

EFFECTS OF FISHING ON THE MARINE ENVIRONMENT

- Recent analysis of potential changes in ecosystem structure of finfish in the South and West Coast Bioregions of Western Australia[16] found no evidence of any systematic change in species diversity or richness, or trophic index, indicating that this fishery is not having a measurable impact on the food chain or trophic structure.
- Demersal gillnets used to catch Dusky Shark in Western Australia are deployed infrequently, over a small proportion of the target fisheries' operational area. The physical impact of the gear on benthic habitats is minimal[6].
- Demersal gillnets are known to interact with threatened and protected species in areas where they are used to catch Dusky Shark. However, such interactions occur at a very low frequency, and have been assessed as posing low to negligible risks to these populations[6].

ENVIRONMENTAL EFFECTS on Dusky Whaler

- Climate change and climate variability have the potential to impact shark stocks in a range of ways, including influencing their geographic distribution (for example, latitudinal shifts in distribution). The impact of environmental changes on Dusky Shark stocks is unknown.

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