

West Australian Dhufish (2020)

Glaucosoma hebraicum



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STOCK STATUS OVERVIEW

Jurisdiction	Stock	Stock status	Indicators
Western Australia	Western Australia	Recovering	Catch, fishing mortality, spawning potential ratio

STOCK STRUCTURE

Molecular analyses of microsatellite DNA indicates that West Australian Dhufish comprises a single biological stock in Western Australia, occurring primarily in the West Coast Bioregion (WCB) between 26°30'S latitude and 115°30'E longitude [Berry et al. 2012, Fairclough et al. 2013].

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

STOCK STATUS

Western Australia The Western Australian Department of Primary Industries and Regional Development uses fishing mortality (F) based assessments for data-limited species that compare to reference levels (target, threshold and limit) based on ratios of natural mortality (M) ($F_{\text{target}} = 2/3M$, $F_{\text{threshold}} = M$ and $F_{\text{limit}} = 3/2M$; [Wise et al. 2007]). Spawning potential ratios (SPR) are determined from these F estimates.

Assessments in 2007 and 2009 demonstrated that F for the Western Australia biological stock of West Australian Dhufish exceeded the limit reference point ($F=0.165$) indicating this species may have been experiencing recruitment overfishing [Wise et al. 2007, Fairclough et al. 2009, O'Neill 2009]. Significant changes were made to the management of both the commercial and recreational sectors in the WCB between late 2007 and early 2010 to reduce catches in each sector by at least 50 per cent of 2005–06 levels (the 'stock recovery benchmarks'). This was designed to allow recovery of stocks, by reducing F to below the threshold level ($F= 0.11$). The stock recovery benchmarks are 82 tonnes (t) and 126 t for the commercial and recreational

sectors in the WCB, respectively.

The most recent estimated landings of West Australian Dhufish in Western Australia (which includes catches in the West and South Coast bioregions) comprised 64 t by the commercial sector in 2019 and 149 t by the recreational sector (private boat-based fishers and charter fishers) in 2017–18 [Ryan et al. 2019, Gaughan and Santoro, 2020].

In the WCB, where the majority of the catch of West Australian Dhufish is taken total annual commercial catches have been below its stock recovery benchmark of 82 t since 2009 (e.g. 53 t in 2019). Catches of the primary commercial fishery for West Australian Dhufish (the West Coast Demersal Scalefish Interim Managed Fishery; WCDSIMF) have also been below its stock recovery benchmark of 72 t since effort limitations for this managed fishery commenced, e.g. 44 t landed in 2019 [Fairclough et al., 2020]. Recent lower commercial catches are also influenced by further reductions in 2015 in effort entitlements of the multi-species WCDSIMF and unit entitlements of the WCDGLIMF to limit catches of Snapper in the WCB to below its commercial stock recovery catch benchmark (see Snapper: West Coast Stock report [Fowler et al. 2020]).

In the WCB only, recreational sector catches (based on periodic estimates of catch ranges by boat-based recreational fishers, plus annual charter catch estimates) have been around or below the benchmark of 126 t since management changes were completed in early 2010. The most recent catch range estimate (95 per cent confidence limits) in the WCB in 2017–18 was 117–153 t. This comprised 123 t (95 per cent confidence interval = 105–141 t) by private boat-based fishers and 12 t by charter fishers [Ryan et al. 2019, Fairclough et al. 2020]. Since management changes to recover stocks, release rates of West Australian Dhufish by the recreational sector have been relatively high (59% by boat based fishers in 2017–18 and 39% by charter fishers in 2018–19). Given an estimated average release mortality rate of 50% in cage-based experiments, high release rates would be resulting in additional fishing mortality on the stock [Ryan et al. 2019, Fairclough et al. 2020].

Assessments of West Australian Dhufish based on age structure data collected in 2008–09 to 2010–11 and 2012–13 to 2014–15 demonstrated that the estimated F ($F = 0.21 y^{-1}$ in 2012–13 to 2014–15) remained above the limit reference point and SPR was between the limit and threshold (SPR_{limit} = 0.2, SPR_{threshold} = 0.3) [Fairclough et al., 2020]. As those assessments were based on age composition data collected during and just after the introduction of management changes, they were not expected to demonstrate significant change, given the biological characteristics of West Australian Dhufish. For example, as a relatively long-lived species [Hesp et al. 2002], recovery would likely take ~20 years [Wise et al. 2007]. The above evidence indicates that the biomass of this stock was likely to be depleted and recruitment likely to be impaired. However, using a method that takes into account a change in F as a result of management change [Fisher 2013], estimated F for age classes recruited to the fishery after management changes commenced in 2008 were lower than for age classes recruited to the fishery prior to management changes (i.e. $F = 0.13$ vs 0.27), indicating recovery had commenced [Fairclough et al., 2020]. The above evidence indicates that the current level of fishing mortality should allow the stock to recover from its recruitment impaired state.

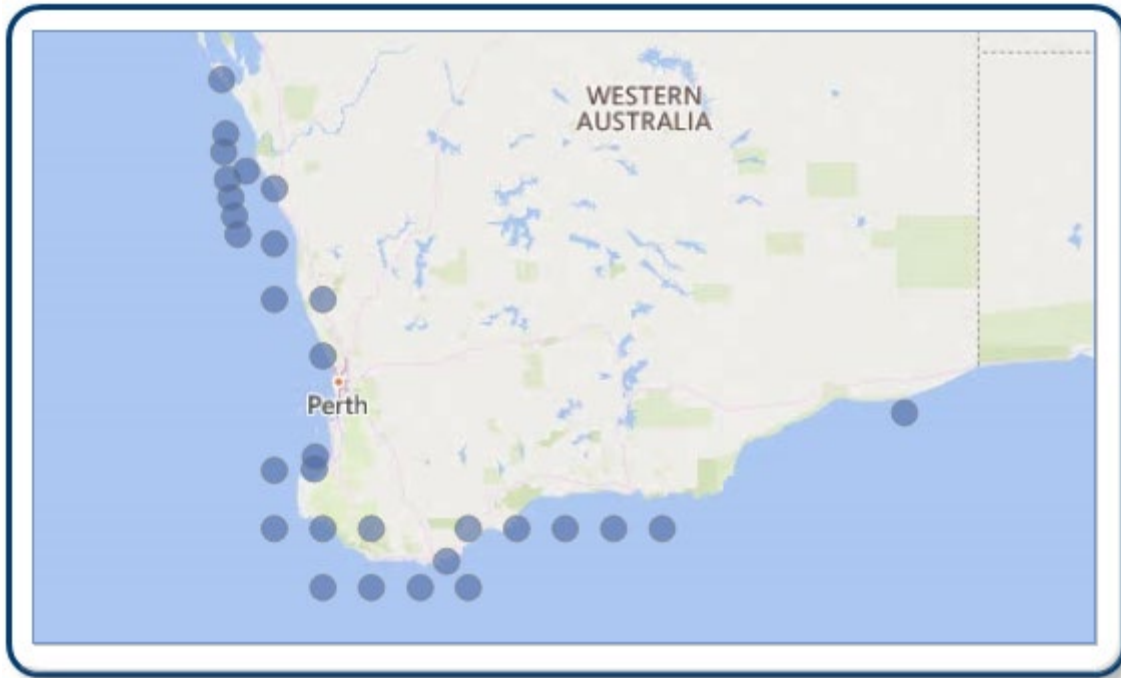
On the basis of the evidence provided above, the Western Australia biological stock is classified as a **recovering stock**.

BIOLOGY

West Australian Dhufish biology [Hesp et al. 2002, Smallwood et al. 2013]

Species	Longevity / Maximum Size	Maturity (50 per cent)
West Australian Dhufish	~41 years, ~1 220 mm TL	~3 years Females ~300 mm TL Males ~320 mm TL

DISTRIBUTION



Distribution of reported commercial catch of West Australian Dhufish

TABLES

Fishing methods	Western Australia
Charter	
Rod and reel	✓
Spearfishing	✓
Commercial	
Dropline	✓
Gillnet	✓
Hand Line, Hand Reel or Powered Reels	✓
Line	✓
Longline (Unspecified)	✓
Recreational	
Hook and Line	✓
Spearfishing	✓

Management	

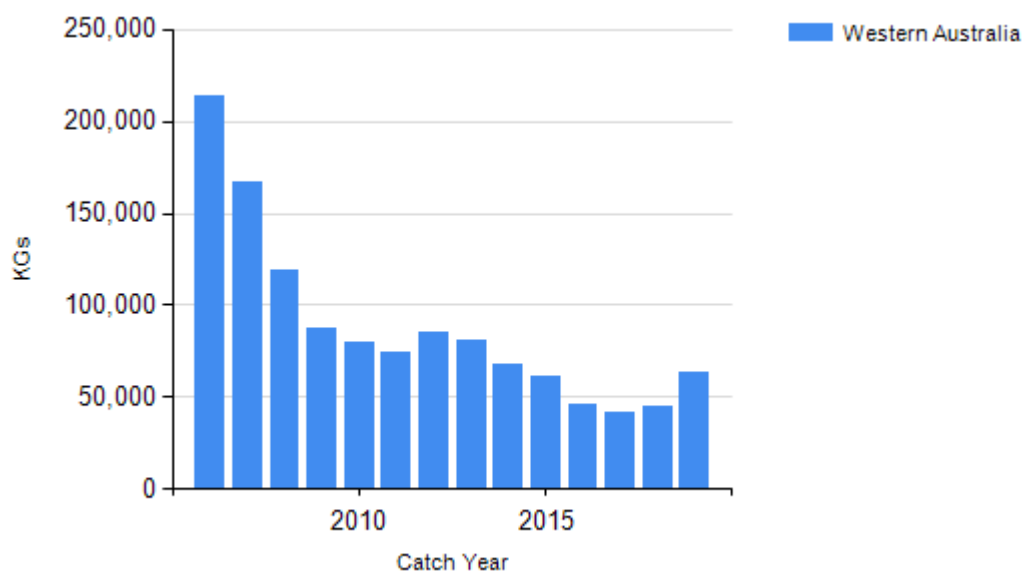
Methods	
	Western Australia
Charter	
Bag limits	✓
Boat limits	✓
Gear restrictions	✓
Licence	✓
Limited entry	✓
Marine park closures	✓
Passenger restrictions	✓
Possession limit	✓
Size limit	✓
Spatial zoning	✓
Temporal closures	✓
Commercial	
Effort limits	✓
Gear restrictions	✓
Limited entry	✓
Marine park closures	✓
Size limit	✓
Spatial closures	✓
Spatial zoning	✓
Total allowable effort	✓
Vessel restrictions	✓
Recreational	
Bag limits	✓
Boat limits	✓
Gear restrictions	✓
Licence (boat-based sector)	✓
Marine park closures	✓
Possession limit	✓
Size limit	✓

Spatial zoning	✓
Temporal closures	✓

Catch	Western Australia
Charter	13 t
Commercial	63.6788 t
Indigenous	Unknown
Recreational	136 t (2017–18)

Western Australia – Indigenous Subject to the defence that applies under 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. **Western Australia – Commercial (catch)** (a) The GDSMF fishing season runs from 1 September–31 August; (b) The JASDGDMF and WCDGDLIMF fishing seasons run from 1 June–31 May; (c) The WCDSIMF runs from 1 January–31 December; and (d) The WL(SC) fishery runs from 1 January–31 December.

CATCH CHART



Commercial catch of West Australian Dhufish - note confidential catch not shown

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