

# Baldchin Groper (2018)

*Choerodon rubescens*



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## STOCK STATUS OVERVIEW

Jurisdiction	Stock	Fisheries	Stock status	Indicators
Western Australia	Western Australia	GDSMF, GDSMF    JASDGLMF    SBBSMNMF    WCDGDLIMF    WCDSIMF, JASDGLMF, SBBSMNMF, WCDGDLIMF, WCDSIMF	Recovering	Spawning potential ratio, fishing mortality rate, catch

GDSMF Gascoyne Demersal Scalefish Managed Fishery (WA), JASDGLMF Joint Authority Southern Demersal Gillnet and Demersal Longline Managed Fishery (Zone 1 & Zone 2) (WA), SBBSMNMF Shark Bay Beach Seine and Mesh Net Managed Fishery (WA), WCDGDLIMF West Coast Demersal Gillnet and Demersal Longline (Interim) Managed Fishery (WA), WCDSIMF West Coast Demersal Scalefish (Interim) Managed Fishery (WA), GDSMF || JASDGLMF || SBBSMNMF || WCDGDLIMF || WCDSIMF Various Fisheries combined due to 3 boat rule (WA)

## STOCK STRUCTURE

Analyses of microsatellite DNA indicates that Baldchin Groper comprises a single biological stock in Western Australia, occurring primarily in the West Coast Bioregion (WCB) south of 27°S latitude and west of 115°30'E longitude [Fairclough et al. 2011, Gardner et al. 2015].

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]). An assessment in 2007 found that  $F$  estimated using linear catch curves for the Western Australia biological stock of Baldchin Groper exceeded the threshold, i.e.  $F = \sim 0.28$ ,  $M = 0.21$  [Department of Fisheries 2015, Wise et al. 2007]. External review supported the finding that this and other assessed indicator species in the demersal resource in the WCB (West

Australian Dhufish and Snapper; [Newman et al. 2018]) had been experiencing recruitment overfishing [O'Neill 2009, Wise et al. 2007].

Changes to the management of fishing for demersal species, including Baldchin Groper, by both the commercial and recreational sectors in the WCB, were introduced between late-2007 and early-2010. These were designed to reduce retained catches by each sector in the WCB by at least 50 per cent of 2005–06 levels to allow recovery of stocks, such that  $F$  would fall below the threshold level ( $M$ ). The 50 per cent catch reduction levels equate to 22 tonnes (t) and 33 t for the commercial and recreational sectors in the WCB, respectively.

Using methods of estimating fishing mortality that take into account recruitment variation [Fisher, 2013], an assessment of age structure data for Baldchin Groper from 2007–08 to 2010–11 (overlapping the period of management change), and a re-assessment of previous age structure data sets, indicated that  $F$  estimates had been above the limit reference point ( $F = 0.39–0.41$ , 1993–95; 2000–02) and were above the limit in 2007/08–2010/11 ( $F = 0.51$ ). The spawning potential ratio (0.24) was between the limit (SPR0.2) and threshold (SPR0.3) in each of those periods [Fairclough et al. 2014].

Annual commercial catches of Baldchin Groper in the WCB have remained below 50 per cent of 2005–06 catch levels (22 t) since 2008 [Fairclough et al. 2018], not exceeding 19 t in any year. Commercial catch in recent years declined further as a result of reductions in effort entitlements in 2015 in the West Coast Demersal Scalefish (Interim) Managed Fishery and unit entitlements of the West Coast Demersal Gillnet and Demersal Longline (Interim) Managed Fishery. These were to limit catches of the West Coast Snapper stock to facilitate its recovery [see Fowler et al. 2018]. Estimated recreational sector catches of Baldchin Groper (biennial estimates for private recreational boat-based fishers [Ryan et al. 2017], plus annual tour operator catches) between 2011–12 and 2015–16 ranged from 38–52 t. Eighty to 90 per cent of those were taken in the WCB (i.e. 31–47 t). These catches were close to or above the 33 t maximum retained catch levels that would allow stock recovery. Management is currently evaluating options to ensure catches do not continue to exceed that level to ensure recovery occurs.

An assessment of indicator species (West Australian Dhufish and Snapper) for the demersal resource in the WCB, which includes Baldchin Groper, was conducted in 2017 (based on 2012–13 to 2014–15 data). Baldchin Groper is assessed aperiodically. Estimated  $F$  values for Western Australian Dhufish ( $F = 0.21$ ) and Snapper ( $F = 0.23$ ) were above their limit reference points ( $F = 0.165$ ,  $0.18$ , respectively) and spawning potential ratios were between the limit and threshold for Western Australian Dhufish ( $SPR = 0.2–0.3$ ) and below the limit of  $SPR = 0.2$  for Snapper [Department of Primary Industries and Regional Development, unpublished data]. That assessment was based on age composition data collected just after management changes were completed. Thus, it was not expected to demonstrate significant change, given the longevity of these species [Hesp et al. 2002, Norriss and Crisafulli 2010] and the likelihood that recovery would take ~20 years [Wise et al. 2007]. However, additional estimates of  $F$  were derived using a method that allows for a change in fishing mortality, i.e. for cohorts of fish that have recruited to a fishery pre- and post-management changes [Fisher 2013]. For the small number of age classes in the 2012–13 to 2014–15 data for West Australian Dhufish and Snapper that recruited to the fishery after management changes commenced in 2008,  $F$  estimates were lower than for age classes recruited to the fishery prior to management changes, i.e.  $F = 0.13$  vs  $0.21$  for Western Australian Dhufish and  $F = 0.14$  vs  $0.27$  for Snapper. This suggests that recovery of these species had commenced and, as indicators of the status of the resource, it is assumed that is also the case for Baldchin Groper [Department of Primary Industries and Regional Development unpublished data, Newman et al. 2018]. The above evidence indicates that at the time of the first assessment in 2007, the biomass of the Western Australia biological stock of Baldchin Groper was likely to have been depleted and recruitment was likely to have been impaired. However, from

the most recent assessment, 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

**Baldchin Groper biology** [Fairclough et al. 2014, Fairclough 2005, Nardi et al. 2006]

Species	Longevity / Maximum Size	Maturity (50 per cent)
Baldchin Groper	~25 years, ~700 mm TL	Female maturity: 4 years, 279 mm TL Protogynous sex change (to male): 12 years, 479 mm TL

## DISTRIBUTION



Distribution of reported commercial catch of Baldchin Groper

## TABLES

Commercial Catch Methods	Western Australia
Dropline	✓
Gillnet	✓
Hand Line, Hand Reel or Powered Reels	✓
Haul Seine	✓
Hook and Line	✓
Longline (Unspecified)	✓

Traps and Pots	✓
Unspecified	✓
<b>Fishing methods</b>	
	<b>Western Australia</b>
<b>Commercial</b>	
Dropline	✓
Gillnet	✓
Hand Line, Hand Reel or Powered Reels	✓
Haul Seine	✓
Hook and Line	✓
Unspecified	✓
<b>Indigenous</b>	
Handline	✓
Spearfishing	✓
Traditional apparatus	✓
<b>Recreational</b>	
Handline	✓
Spearfishing	✓
<b>Management Methods</b>	
	<b>Western Australia</b>
<b>Charter</b>	
Bag limits	✓
Gear restrictions	✓
Limited entry	✓
Marine park closures	✓
Passenger restrictions	✓
Size limit	✓
Spatial closures	✓
Temporal closures	✓
<b>Commercial</b>	
Catch limits	✓
Effort limits	✓
Gear restrictions	✓

Limited entry	✓
Size limit	✓
Spatial closures	✓
Vessel restrictions	✓
<b>Indigenous</b>	
Bag limits	✓
Gear restrictions	✓
Possession limit	✓
Size limit	✓
Spatial closures	✓
Temporal closures	✓
<b>Recreational</b>	
Bag limits	✓
Gear restrictions	✓
Licence (fishing from a boat)	✓
Marine park closures	✓
Possession limit	✓
Size limit	✓
Spatial closures	✓
Temporal closures	✓
<b>Active Vessels</b>	
	<b>Western Australia</b>
	7 in GDSMF, &3 in JASDGLMF, &3 in SBBSMNMF, 5 in WCDGDLIMF, 35 in WCDSIMF, 53 in Charter,

**GDSMF** Gascoyne Demersal Scalefish Managed Fishery(WA)

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

**SBBSMNMF** Shark Bay Beach Seine and Mesh Net Managed Fishery(WA)

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

**WCDSIMF** West Coast Demersal Scalefish (Interim) Managed Fishery(WA)

**Charter** Tour Operator(WA)

Catch	Western Australia
<b>Charter</b>	13 t (2015–16)
<b>Commercial</b>	7.70953t in GDSMF    JASDGDLMF    SBBSMNMF    WCDGDLIMF    WCDSIMF,
<b>Indigenous</b>	Unknown
<b>Recreational</b>	39 t (± 4 t se; 2015–16)

GDSMF Gascoyne Demersal Scalefish Managed Fishery (WA), JASDGDLMF Joint Authority Southern Demersal Gillnet and Demersal Longline Managed Fishery (Zone 1 & Zone 2) (WA), SBBSMNMF Shark Bay Beach Seine and Mesh Net Managed Fishery (WA), WCDGDLIMF West Coast Demersal Gillnet and Demersal Longline (Interim) Managed Fishery (WA), WCDSIMF West Coast Demersal Scalefish (Interim) Managed Fishery (WA), GDSMF || JASDGDLMF || SBBSMNMF || WCDGDLIMF || WCDSIMF Various Fisheries combined due to 3 boat rule (WA),

**Western Australia – Commercial (catch)** The GDSMF fishing season runs from 1 September–31 August.

**Western Australia – Commercial (catch)** The JASDGDLMF and WCDGDLIMF fishing seasons run from 1 June–31 May.

**Western Australia – Commercial (catch)** The WCDSIMF fishing season runs from 1 January–31 December.

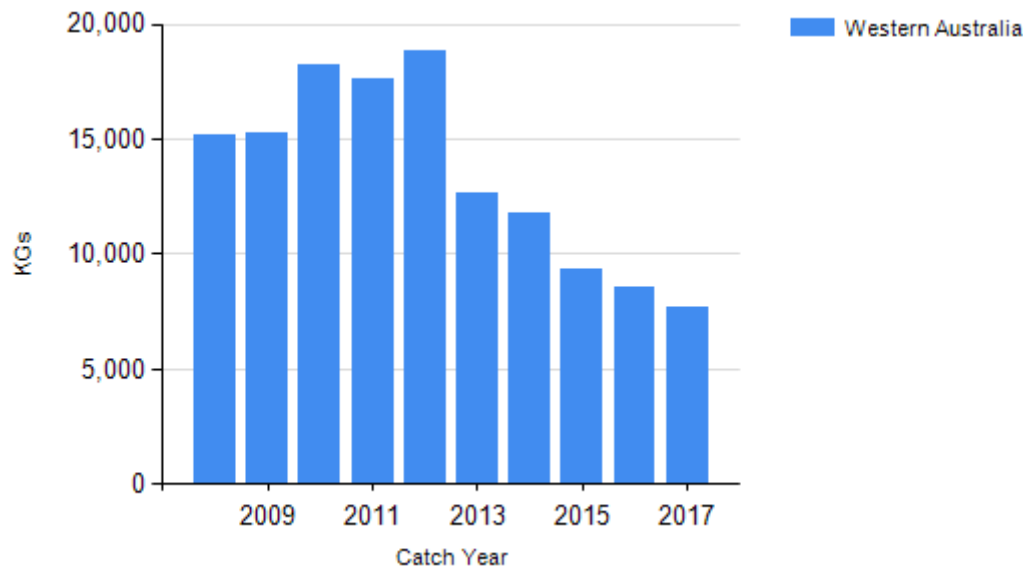
**Western Australia – Commercial (catch)** The SBBSMNMF fishing season runs from 1 January–31 December.

**Western Australia – Recreational (catch)** The boat-based recreational catch is for a full year survey.

**Western Australia – Recreational tour operator (catch)** The recreational charter catch is for a full year from 1 July–30 June.

**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 those for recreational fishing.

## CATCH CHART



Commercial catch of Baldchin Groper - note confidential catch not shown

## EFFECTS OF FISHING ON THE MARINE ENVIRONMENT

### ENVIRONMENTAL EFFECTS on Baldchin Groper

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