Brownlip Abalone (2023)

Haliotis rubra conicopora

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STOCK STATUS OVERVIEW

Jurisdiction	Stock	Stock status	Indicators
Western Australia	Western Australia Area 2 Fishery	Depleted	Catch, CPUE, meat weight, length composition, fishing mortality, relative spawning biomass
Western Australia	Western Australia Area 3 Fishery	Sustainable	Catch, CPUE, meat weight, length composition, fishing mortality, relative spawning biomass
South Australia	South Australia Western Zone Fishery	Undefined	

STOCK STRUCTURE

Brownlip Abalone is distributed from the south-west of Western Australia to the west of South Australia. Brownlip Abalone are endemic to the south-west of Australia, but there is evidence to suggest that they are genetically similar to, and potentially conspecific with, Blacklip Abalone (*Haliotis rubra rubra*) [Brown and Murray 1992], which are distributed east from Western Australia across southern mainland Australia to northern New South Wales and Tasmania. The biological stock structure of Brownlip Abalone has not been examined. As there is no genetic evidence to confirm biological stock structure of Brownlip Abalone, assessment of stock status is presented here at the management unit level—Western Australia Area 2 Fishery, Western Australia Area 3 Fishery and South Australia Western Zone Fishery.

STOCK STATUS

South Australia Western Zone Fishery

Brownlip Abalone is considered to be rare in South Australia, but likely found in the western fishing areas of the South Australia Western Zone Fishery (SAWZF) that have high relative catch contributions. Brownlip Abalone is not differentiated from Blacklip Abalone in commercial catch returns as it can be difficult to distinguish from blacklip abalone. Consequently, there is no reported catch of Brownlip Abalone by commercial or recreational fishers in South Australia. There is no published assessment of this species, and there are no data available to estimate biomass or exploitation rates. In addition, there is no knowledge on recruitment or harvestable biomass, and there are no defined target or limit reference levels. 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 South Australia Western Zone Fishery management unit is classified as an **undefined stock**.

Western Australia Area 2 Fishery

Brownlip Abalone catches in the Western Australia Area 2 and Area 3 Fisheries (WAA2F and WAA3F) are controlled by a Total Allowable Commercial Catch (TACC), set annually in accordance with harvest control rules defined in the Abalone Resource of Western Australia Harvest Strategy 2021–26 [DPIRD 2023]. The harvest control rule uses annual standardised catch per unit effort (SCPUE) as the key Performance Indicator (PI) against specified limit, threshold and target reference levels. The reference levels for the Western Australia Area 2 and Area 3 Fisheries have recently been updated based on outputs from model-based assessments that have provided estimates of biomass relative to the levels associated with Maximum Sustainable Yield (MSY); i.e., BMSY. The target, threshold and limit reference levels for SCPUE in each management area are now equivalent to the values of SCPUE corresponding to estimated biomass at 1.2 BMSY, BMSY and 0.5 BMSY, respectively [DPIRD 2023]. The Western Australia Area 2 Fishery is defined as depleted if the PI is below the limit reference level.

In the WAA2F, the annual SCPUE for Brownlip Abalone was relatively stable between 1999 and 2011, just under the threshold reference level. However, over the next five seasons (2012–16) the SCPUE declined markedly to below the limit reference level. The SCPUE then increased over the next two seasons (above limit in 2018) before declining again to below the limit (2019). The SCPUE has been below the limit reference level for the last four seasons. The Brownlip abalone SCPUE in the WAA2F has been at historical low levels for the last ten seasons since a sharp decline following the 2011 marine heatwave. The TACC was reduced to 50% of the long-term sustainable harvest level (MSY) in 2021 and further reduced to 25% of MSY in 2022 as directed by the harvest control rule in the revised Harvest Strategy [DPIRD 2023]. Brownlip Abalone mean meat weight (individual animal) has been relatively constant at 230 to 260 g since 2010, however this is lower than the 270 to 280 g for Brownlip Abalone caught through the early to mid-2000s [Hart et al. 2017]. The fishery has a legal minimum length of 145 mm, which allows 2–4 years of spawning to occur before recruitment to the fishery.

Results from biomass dynamics models applied to the available annual catch and SCPUE data for Brownlip Abalone in WAA2F, including a state space model [Winker et al. 2018], indicate that the stock is currently depleted. Thus, current biomass is estimated to be around the limit reference level (0.5 BMSY). Estimates of fishing mortality (F) exhibit a general increasing trend from 1989 through to 2014, at which time the value was well above FMSY (i.e., the long-

term average level of fishing mortality required to achieve MSY), indicating that the stock was being overfished. Estimates of F have subsequently declined to well below FMSY in the last two years, indicating that fishing mortality has been sufficiently reduced to allow stock recovery. The above evidence indicates that the biomass of this stock is likely to be depleted and that recruitment is likely to be impaired. The above evidence further indicates that current fishing mortality is constrained by management to a level that should allow the stock to recover from its recruitment-impaired state; however, measurable improvements are yet to be detected.

Based on the evidence provided above, the Western Australia Area 2 Fishery management unit is classified as a **depleted stock.**

Western Australia Area 3 Fishery

Brownlip Abalone catches in the Western Australia Area 3 Fishery (WAA3F) are managed by the same Harvest Strategy and TACC setting process as described above in the WAA2F and defined in the Abalone Resource of Western Australia Harvest Strategy 2021–26 [DPIRD 2023]. In the WAA3F, the annual SCPUE for Brownlip Abalone fluctuated greatly during the 1999 to 2010 period. From 2011 to 2018, the SCPUE exhibited an increasing trend from below the threshold level to above the target (i.e., equivalent to 1.2 BMSY). Over the last five seasons the SCPUE has fluctuated around the target reference level. Between 2012 and 2015 the TACC was reduced by 37.5%, after which time the SCPUE increased from below the threshold level to above the target by 2018. Brownlip Abalone mean meat weight (individual animal) in WAA3F increased from 230 g in 2013 to 271 g in 2019, reaching the 270 to 280 g meat weights that prevailed through the 2000s before declining sharply between 2009 and 2013 [Hart et al. 2017]. During the last three seasons, meat weights declined further to 256 g. The fishery has a legal minimum length of 150 mm, which allows 2–4 years of spawning to occur before recruitment to the fishery.

Results from biomass dynamics models applied to the available annual catch and SCPUE data for Brownlip Abalone in WAA3F, including a state space model [Winker et al. 2018], indicate that the stock is currently sustainable. Thus, current biomass is estimated to be above the target reference level (1.2 BMSY). Estimates of fishing mortality (F) have remained below FMSY (i.e., the long-term average level of fishing mortality required to achieve MSY) in most years between 1989 and 2022. In recent years, the values of F are well below estimated FMSY, indicating that overfishing is not currently occurring. The above evidence indicates that current levels of fishing mortality and biomass of Brownlip Abalone in WAA3F are sustainable.

An integrated length-based stock assessment model [Strain et al. 2017], using data mainly from WAA3F but with some from WAA2F, has been applied to available data for Brownlip Abalone up to 2020, including commercial catch and SCPUE data, length composition data, and parameters associated with growth and reproduction. The integrated model estimated that the spawning biomass (relative to that for an unfished stock) has remained above the level equating to BMSY in 2020, which implies that the stock in WAA3F is likely to have remained above this level. The above evidence indicates that the biomass of this stock is unlikely to be depleted and that the current level of fishing mortality is unlikely to cause the stock to become recruitment impaired.

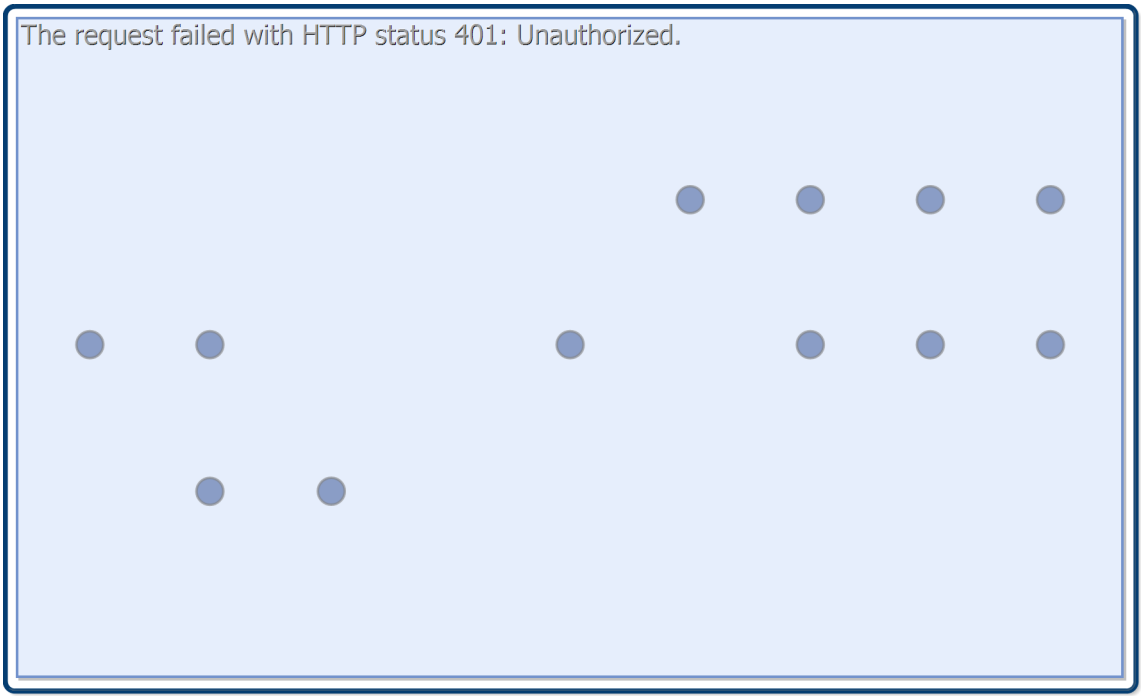
Based on the evidence provided above, the Western Australia Area 3 Fishery management unit is classified as a **sustainable stock.**

BIOLOGY

Brownlip Abalone biology [Strain et al. 2017; Strain et al. 2020]

Species	Longevity / Maximum Size	Maturity (50 per cent)
Brownlip Abalone	20 years, 220 mm SL	3–5 years, 100–110 mm SL

DISTRIBUTION



Distribution of reported commercial catch of Brownlip Abalone

TABLES

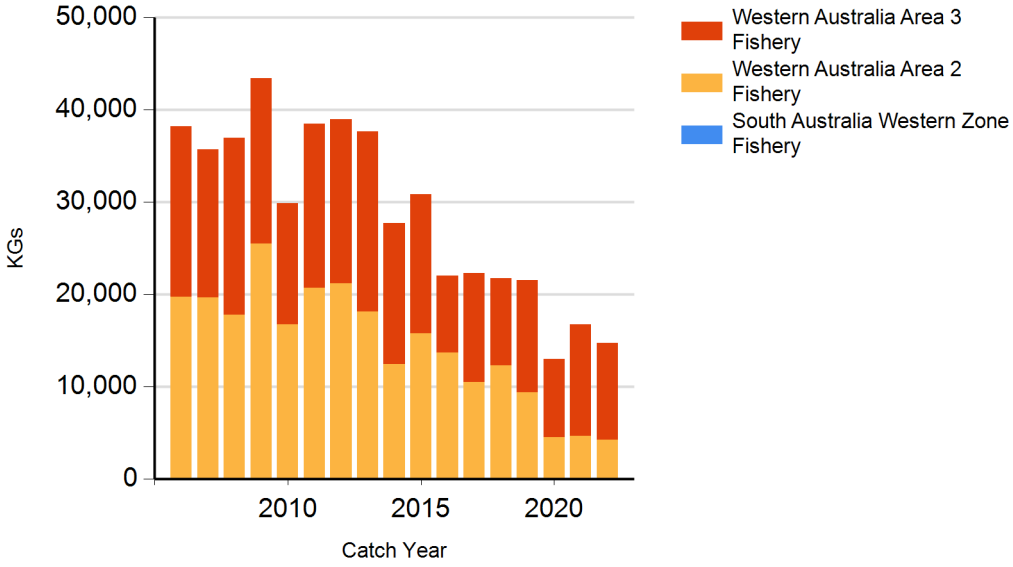
Fishing methods		
	South Australia	Western Australia
Commercial		
Diving		✓
Unspecified	✓	
Recreational		
Diving	✓	✓

Management Methods		
	South Australia	Western Australia
Commercial		
Limited entry	✓	✓
Size limit	✓	✓
Total allowable catch	✓	✓
Recreational		
Bag limits	✓	✓
Licence		✓
Size limit	✓	✓
Temporal closures		✓

Catch		
	South Australia	Western Australia
Commercial	0 t	14.7582 t
Indigenous	Unknown	Unknown
Recreational	Unknown	3.75 t (combined Brownlip Abalone in WAA2F and WAA3F)

Western Australia - Recreational (Catch Volume). [Smallwood et al. 2023]

CATCH CHART



Commercial catch of Brownlip Abalone - note confidential catch not shown.

References

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