

Wavy Periwinkle (2018)

Lunella undulata



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STOCK STATUS OVERVIEW

Jurisdiction	Stock	Fisheries	Stock status	Indicators
New South Wales	New South Wales	N/A	Negligible	Catch history
Victoria	Victoria	N/A	Negligible	Catch history
Tasmania	Tasmania	TBC	Sustainable	Catch rates, size structure
South Australia	South Australia	SA	Sustainable	Catch, catch rate, mean weight

N/A Not Applicable (NSW), N/A Not Applicable (VIC), SA SA Periwinkle Fishery (SA), TBC Periwinkle Fishery (TAS)

STOCK STRUCTURE

The Wavy Periwinkle, *Lunella undulata*, is a moderately sized marine gastropod found on exposed sand-scoured reef and boulder habitat in shallow temperate waters (0–20 m) of southern Australia. They grow to a maximum length of around 65 mm and are distributed from Hopetoun, Western Australia to Coolangatta, Queensland, and around Tasmania [Edgar 2012]. Wavy Periwinkles form large aggregations in shallow coastal waters. The Wavy Periwinkle has a protracted spawning period from October to May, and may undergo incomplete spawning (retain unshed eggs until the next spawning event) [Keane et al. 2014, Underwood 1974]. They have short-term lecithotrophic larvae (planktonic larvae which live off the yolk supplied by the egg), and it is assumed that the larval duration is about five days, similar to other species within the taxon [Underwood 1974]. Stock structure is unknown, however a study into genetic diversity across southern Australia is underway.

Here, assessment of stock status is presented at the jurisdictional level—New South Wales, Victoria, Tasmania and South Australia.

STOCK STATUS

New South Wales The Wavy Periwinkle is a species within the broader number of species defined within the New South Wales Sea Urchin and Turban Shell (SUTS) Fishery. Prior to 2009–10 catches of species of Turban Shells (including Wavy Periwinkle) were aggregated into a group of species defined as 'Turban Shell – other'. Since

2009–10 the annual reported commercial catch of Wavy Periwinkles has been less than 0.15 t. Stock status for the New South Wales stock is reported as Negligible due to historically low catches in this jurisdiction and the stock has not been subject to targeted fishing. Recreational and Indigenous catches of Wavy Periwinkles (or other Turban Shells) in New South Wales are unknown. Surveys of recreational and Indigenous catches have either not specified the species or species group [West et al. 2015] or reported them into a broader 'shells - other' category [Henry and Lyle 2003]. Fishing is unlikely to be having a negative impact on the stock.

South Australia

The South Australian fishery for Wavy Periwinkle has operated since 2001. Fishing occurs throughout the year with product sold on domestic and international markets [PIRSA 2018]. Prior to July 2018, fishing was permitted through Ministerial exemption and is now managed using exploratory and developmental fishing permits. Fishing is restricted to hand collection by a small number of fishers [PIRSA 2018]. Annual catches (confidential) have been stable at a low level for > 10 years. No formal assessment for this fishery has been completed. The primary measures for biomass and fishing mortality are the commercial catch rate (kg per hr) and the mean weight of landed Periwinkles. The commercial catch rate increased in the early years of the fishery to a peak in 2013 and has been stable at a historically high level from 2013 to 2017. Mean weight (g) of landed Periwinkle has been stable throughout the history of the fishery (17 years, 55.5 g). The above evidence indicates that the biomass of this stock is unlikely to be depleted and that recruitment is unlikely to be impaired. Furthermore, the above evidence indicates that the current level of fishing mortality is unlikely to cause the stock to become recruitment impaired.

On the basis of the evidence provided above, Wavy Periwinkle in South Australia is classified as a **sustainable stock**.

Tasmania

The harvest strategy for Wavy Periwinkles in Tasmania in the Commercial Dive Fishery policy document [DPIPWE 2005, 2011] uses catch rates and size structure as performance indicators for the fishery. Trigger points for catch rates are reached if there is a decline of 20 per cent in each of two consecutive years or 35 per cent in a year. The fishery is managed by both input and output controls including limited entry, a total allowable commercial catch of 52.8 tonnes (t) split into five zones and a 45 mm size limit which allows populations to spawn twice before entering the fishery [Keane et al. 2014].

Catches in the fishery since the introduction of a management plan in 2005 have varied between 13.0 t in 2009–10 to 41.0 t in 2014–15. The 2016–17 catch was 38.5 t. Catch rates have averaged 66.1 kg per hr since 2009 when the size limit increased from 30 to 40 mm, and have not varied any more than 18 per cent from this mean. A size limit increase in 2014 to 45 mm saw no impact on catch rates. Catch rates in the 2016–17 season averaged 68.4 kg per hr.

The above evidence indicates that the biomass of this stock is unlikely to be depleted and that recruitment is unlikely to be impaired. Furthermore, the above evidence indicates that the current level of fishing mortality is unlikely to cause the stock to become recruitment impaired.

On the basis of the evidence provided above (robust size limit and stable catch rates), the Tasmanian Periwinkle stock is classified as a **sustainable stock**.

Victoria

Catches of Wavy Periwinkle in Victoria have recently been low and the stock has generally not been subject to targeted fishing. The stock has not been identified as overfished in the past and it is likely that the stock can sustain a higher catch than is currently taken. Stock status for the Victorian stock is reported as Negligible due to historically low catches in this jurisdiction and the lack of targeting. Fishing is unlikely to be having a negative impact on the stock. There

is little information available and a stock assessment is not justifiable.

BIOLOGY

Wavy Periwinkle biology [Keane et al. 2014]

Species	Longevity / Maximum Size	Maturity (50 per cent)
Wavy Periwinkle	~ 10 years, 65 mm TL	23–26 mm TL

DISTRIBUTION



Distribution of reported commercial catch of Wavy Periwinkle

TABLES

Commercial Catch Methods	New South Wales	South Australia	Tasmania	Victoria
Diving		✓	✓	
N/A	✓			✓
Unspecified			✓	

Fishing methods	South Australia	Tasmania
Commercial		
Diving	✓	✓
Unspecified		✓
Recreational		
Hand collection	✓	✓

Management Methods	South	Tasmania

	Australia	
Commercial		
Gear restrictions	✓	✓
Limited entry	✓	✓
Marine park closures	✓	✓
Size limit		✓
Spatial closures		✓
Spatial zoning		✓
Total allowable catch		✓
Recreational		
Bag limits		✓
Gear restrictions	✓	✓
Marine park closures	✓	✓

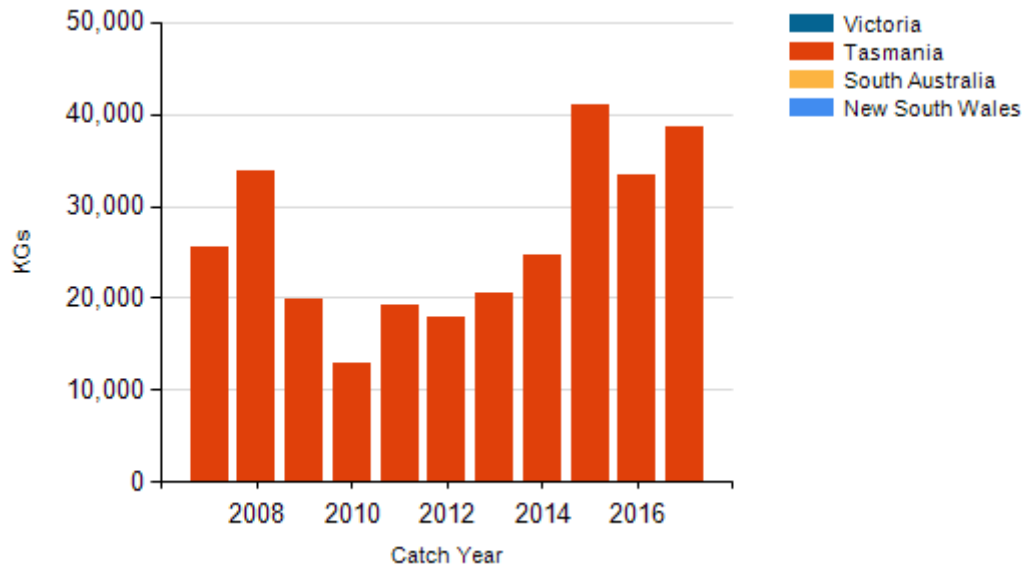
Active Vessels	
	South Australia
	1 Exemption in SA,

SA SA Periwinkle Fishery(SA)

Catch	New South Wales	South Australia	Tasmania	Victoria
Commercial			38.516t in TBC,	
Indigenous		Unknown	Unknown	
Recreational		Unknown	Unknown	

N/A Not Applicable (NSW), N/A Not Applicable (VIC), SA SA Periwinkle Fishery (SA), TBC Periwinkle Fishery (TAS),

CATCH CHART



Commercial catch of Wavy Periwinkle - note confidential catch not shown

EFFECTS OF FISHING ON THE MARINE ENVIRONMENT

ENVIRONMENTAL EFFECTS on Wavy Periwinkle

References	
543	DPIPWE 2005, Policy Document for the Tasmanian Commercial Dive Fishery. Department of Primary Industries, Water and Environment. Hobart, Tasmania, 36p.
544	DPIPWE 2011, 2011 Update of Policy Document for the Tasmanian Commercial Dive Fishery. Department of Primary Industries, Water and Environment. Hobart, Tasmania, 9p.
545	Edgar, G 2012, Australian Marine Life: The Plants and Animals of Temperate Waters, New Holland, Chatswood, NSW.
546	Henry, GW and Lyle, JM 2003, The national recreational and Indigenous fishing survey. Fisheries Research and Development Corporation, Canberra.
547	Keane, JP, Lyle, J, Mundy, C and Hartmann, K 2014, Periwinkle Fishery of Tasmania: Supporting Management and a Profitable Industry, Institute for Marine and Antarctic Studies Hobart.
548	PIRSA 2018, Ecological Assessment of South Australian Commercial Miscellaneous Fishing Activities: Reassessment Report Incorporating Harvest of Sea Urchin, Specimen Shell and Turbo. Primary Industries and Resources South Australia (Fisheries and Aquaculture) Adelaide, 11p.
549	Underwood, AJ 1974, The reproductive cycles and geographical distribution of some common eastern Australian prosobranchs (Molluscs: Gastropoda). Australian Journal of Marine and Freshwater Research, 25: 63–88.
550	West, LD, Stark, KE, Murphy, JJ, Lyle, JM and Ochwada-Doyle, FA 2015, Survey of recreational fishing in New South Wales and the ACT, 2013/14. Fisheries Final Report Series No. 149. NSW Department of Primary Industries, Wollongong.