

Wavy Periwinkle (2020)

Lunella undulata



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STOCK STATUS OVERVIEW

Jurisdiction	Stock	Stock status	Indicators
New South Wales	New South Wales	Negligible	Catch history
Victoria	Victoria	Negligible	Catch history
South Australia	South Australia	Undefined	

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) [Underwood 1974, Keane et al. 2014]. 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 of 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 Stock status for the New South Wales Wavy Periwinkle stock is reported as **negligible** due to historically low catches in this jurisdiction and the stock has generally not been subject to targeted fishing. The Wavy Periwinkle is one of a 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 tonnes (t). 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 surveyed any harvest of Turban Shells [Murphy et al. 2020], 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 with fishing restricted to hand collection by a small number of fishers [PIRSA 2018]. Annual catches (confidential) were stable at a low level for > 10 years but declined to 13 per cent below the most-recent ten-year average in 2017–18 and 2018–19. Fishing effort (hours) and the number of active fishers also declined. The commercial catch rate increased from the early years of the fishery to a peak in 2012–13, then declined to approximately 4 per cent above the most recent ten-year average in 2018–19. Mean weight (g) of landed Periwinkle was stable throughout the history of the fishery but was 3 per cent above the most recent ten-year average in 2018–19. There is no published assessment of Wavy Periwinkle, 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. These limitations prevent 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 available evidence, Wavy Periwinkle in South Australia is classified as an **undefined** 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 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 2018–19 catch was 33.6 t. Catch rates have averaged 66.1 kg per hr between 2009 when the size limit increased from 30 to 40 mm and 2016–17. During this period annual catch rates have not varied 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 2018–19 season averaged 58.7 kg per hr which is within the historical range of CPUE.

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

Stock status for Wavy Periwinkle in Victoria is reported as **negligible** due to historically low catches in this jurisdiction and a general lack of targeted fishing. Confidentiality provisions preclude full disclosure of catches for the period 2000–

2019, but catches have generally been small and irregular. The number of divers participating in the fishery in any given year during the past two decades has ranged from 1–11, with a median of 2. In the most recent decade only one, but not the same, diver was responsible for landing most if not all of the catch (median = 99 per cent). The pattern of catches, with occasional peaks of several tonnes, reflects the combined effects of the fickle nature of the local market demand for this species, and divers' participation in other more lucrative fisheries that often compete for their effort on suitable diving days. 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. Fishing is unlikely to be having a negative impact on the stock and it is unlikely that the current level of fishing mortality will cause the stock to become recruitment impaired. 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

Fishing methods	New South Wales	South Australia	Tasmania	Victoria
Commercial				
Diving		✓		✓
Traps and Pots				✓
Various	✓			

Recreational				
Hand collection	✓	✓	✓	

Management Methods			
	New South Wales	South Australia	Tasmania
Commercial			
Gear restrictions	✓	✓	✓
Limited entry	✓	✓	✓
Marine park closures		✓	✓
Size limit			✓
Spatial closures	✓		✓
Spatial zoning			✓
Total allowable catch			✓
Recreational			
Bag and possession limits	✓		
Bag limits			✓
Gear restrictions		✓	✓
Licence	✓		
Marine park closures		✓	✓
Spatial closures	✓		

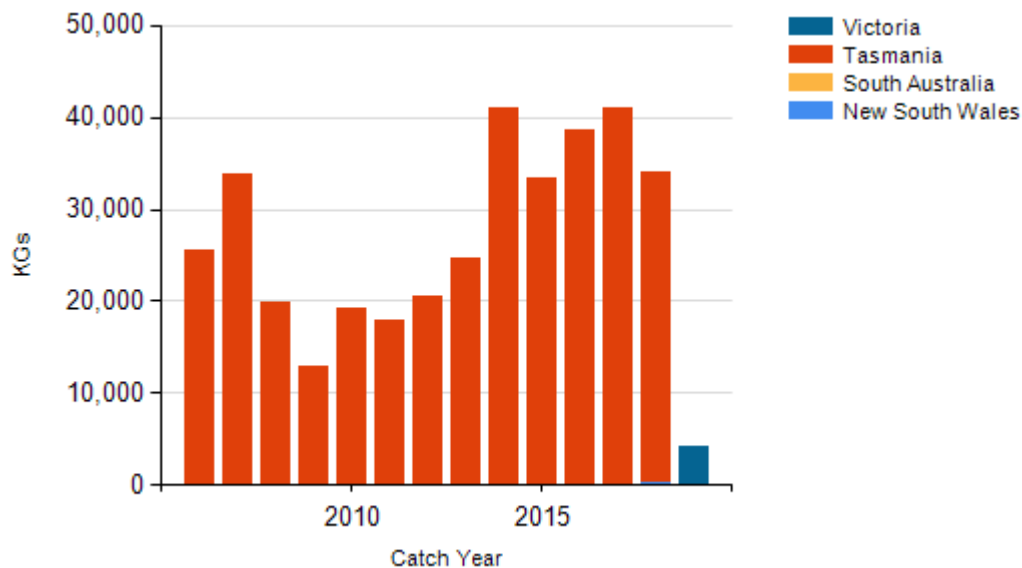
Catch				
	New South Wales	South Australia	Tasmania	Victoria
Commercial	0.0055 t	0 t		4.30888 t
Indigenous	Unknown	Unknown	Unknown	
Recreational	Unknown	Unknown	Unknown	

New South Wales – Indigenous <https://www.dpi.nsw.gov.au/fishing/aboriginal-fishing>

Victoria – Indigenous (Management Methods) A person who identifies as Aboriginal or Torres Strait Islander is exempt from the need to obtain a Victorian recreational fishing licence, provided they comply with all other rules that apply to recreational fishers, including rules on equipment, catch limits, size limits and restricted areas. Traditional (non-commercial) fishing activities that are carried out by members of a traditional owner group entity under an

agreement pursuant to Victoria's *Traditional Owner Settlement Act 2010* are also exempt from the need to hold a recreational fishing licence, subject to any conditions outlined in the agreement. Native title holders are also exempt from the need to obtain a recreational fishing licence under the provisions of the Commonwealth's *Native Title Act 1993*.

CATCH CHART



Commercial catch of Wavy Periwinkle - note confidential catch not shown

References	
DPIPWE 2005	DPIPWE 2005, Policy Document for the Tasmanian Commercial Dive Fishery. Department of Primary Industries, Water and Environment. Hobart, Tasmania, 36p.
DPIPWE 2011	DPIPWE 2011, 2011 Update of Policy Document for the Tasmanian Commercial Dive Fishery. Department of Primary Industries, Water and Environment. Hobart, Tasmania, 9p.
Edgar 2012	Edgar, G 2012, Australian Marine Life: The Plants and Animals of Temperate Waters, New Holland, Chatswood, NSW.
Henry and Lyle 2003	Henry, GW and Lyle, JM 2003, The national recreational and Indigenous fishing survey. Fisheries Research and Development Corporation, Canberra.
Keane et al. 2014	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.
PIRSA 2018	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.
Underwood 1974	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.
West et al. 2015	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.
Murphy et al. 2020	Murphy, J.J., Ochwada-Doyle, F.A., West, L.D., Stark, K.E. and Hughes, J.M., 2020. The NSW Recreational Fisheries Monitoring Program - survey of recreational fishing, 2017/18. NSW DPI - Fisheries Final Report Series No. 158.

