

Ballot's Saucer Scallop (2020)

Ylistrum balloti



Mervi Kangas: Department of Primary Industries and Regional Development. Western Australia, **Anthony Roelofs:** Department of Agriculture and Fisheries, Queensland

STOCK STATUS OVERVIEW

Jurisdiction	Stock	Stock status	Indicators
Western Australia	Abrohos Island and Mid-West Trawl managed Fishery	Sustainable	Recruitment surveys, CPUE, catch
Western Australia	Shark Bay Scallop Managed Fishery	Sustainable	Recruitment surveys, catch, CPUE
Western Australia	South Coast Trawl Fishery	Sustainable	Catch, CPUE, area fished
Western Australia	South West Trawl Managed Fishery	Sustainable	Catch, effort, area fished
Queensland	East Coast Otter Trawl Fishery	Depleted	Stock assessment, estimated biomass, abundance survey, CPUE, catch, effort. test

STOCK STRUCTURE

Ballot's Saucer Scallop in Australian waters are now classified as *Ylistrum balloti* (formerly *Amusium balloti*) following a recent revision of the genus *Amusium* [Mynhardt et al. 2014]. This species is distributed from Israelite Bay in Western Australia, across the tropics, to the southern coast of New South Wales. Over this extensive species range, Ballot's Saucer Scallops only occur in high abundance in parts of this range. Scallop recruitment is also highly variable, both seasonally and spatially within these higher abundance areas. In Western Australia, Ballot's Saucer Scallop occur along most of the coast but given the vast length of this coastline and the potential for regional differences in recruitment, four separate management units have been established in this jurisdiction for those areas where Ballot's Saucer Scallop occur in commercial quantities.

The eastern Australian stock stretches from Innisfail in Queensland to Jervis Bay in New South Wales. No fishery for Ballot's Saucer Scallop exists in New South Wales waters. The stock classification presented here is based on information from the commercial fishery in central and southern Queensland (latitude 22°–27° south) where higher abundances of scallops occur.

Here, assessment of stock status is presented at the management unit level—Shark Bay Scallop Managed Fishery, Abrolhos Islands and Mid-West Trawl Managed Fishery, South West Trawl Managed Fishery and South Coast Trawl Fishery (Western Australia); and East Coast Otter Trawl Fishery (Queensland).

STOCK STATUS

Abrolhos Island and Mid-West Trawl managed Fishery The Abrolhos Islands and Mid-West Trawl Managed Fishery (Western Australia) management unit is managed under an escapement approach in the Harvest Strategy (DPIRD 2020). The impact on the spawning biomass is limited by fishing after the peak spawning period; setting the duration of fishing according to catch predictions (based on pre-season surveys); closing the fishery at a minimum catch rate threshold (150 kg meat weight per day); and not opening sections of the fishery if Ballot's Saucer Scallop abundance is considered to be below a specified target (750 scallops/nm) [DPIRD 2020, Gaughan and Santoro 2020].

The pre-season fishery independent survey index (November 2018) was 1815 scallop/nm well above the target and within the historical range (250–4000 scallop/nm) and in early 2019 the index was 3247 scallop/nm indicating a continued recovery and expansion of areas of scallop settlement within the Abrolhos Islands. The above evidence indicates that the biomass of this stock is unlikely to be depleted and that recruitment is unlikely to be impaired.

The landings in 2019 were 159 t meat weight (796 t whole weight) (125 t meat weight in 2018–19 financial year) which was within the expected range and fishers ceased fishing at a catch rate above the threshold (150 kg/day). 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, the Abrolhos Islands and Mid-West Trawl Managed Fishery (Western Australia) management unit is classified as a **sustainable stock**.

East Coast Otter Trawl Fishery In Queensland, the annual catch of Ballot's Saucer Scallop has been declining since 2001 when annual harvests of legal sized scallops were generally ≥ 800 t meat weight. Annual harvests since 2011 have been mostly ≤ 400 tonnes. Harvest in the 2018 and 2019 fishing years were 163 tonnes and 246 tonnes (meat weight) respectively for the stock in the main fishing grounds between Yepoon and Hervey Bay [Wortmann et al. 2020]. Total harvest from the overall East Coast Otter Trawl Fishery increased to 281 t meat weight in 2019 from a historical low level of 134 t in 2017 [QFISH 2020].

The most recent update to the stock assessment [Wortmann et al. 2020] estimated that the spawning biomass of the East Coast biological stock of Ballot's Saucer Scallop in 2019 was 17 per cent of unfished levels in 1956. Commercial-sized scallop density (number of legal sized scallops per hectare in October) from a fishery-independent survey had also decreased from 93 to 56 scallops per hectare from 2018 to 2019, although this was slightly higher than 2017 (38 scallop per hectare). The above evidence indicates that the biomass of this stock is likely to be depleted and that recruitment is likely to be impaired.

A long-term decline in the annual number of scallop harvesting days has been evident since 1997, when the stock was first considered to be overfished. Effort in 2019 was nearly 86 per cent lower than in 1997, however it is only 32 per

cent lower than the previous 10 year average [QFISH 2020]. A shift in fleet composition towards more efficient vessels has increased fishing power since 2000 [Campbell et al. 2012] and fishing pressure is high relative to the available biomass. Spatial and temporal closures introduced in late 2016 to reduce fishing pressure and a no take closure period for scallops from May-October have resulted in minor reductions in annual effort. Further changes were implemented in 2019 including a restriction on total effort on the stock (118 635 effort units) and an extension of the scallop no-take period by 1 month to include November. Additional reforms are currently being considered for the 2020–21 fishery season including a further restriction on effort and extended closure periods. Recommendations from the most recent assessment suggest that reducing the total effort cap to 80 000 effort units would allow the stock to rebuild to BMSY in approximately 10 years [Wortmann et al. 2020]. However at the current effort cap, the stock assessment forecasts it would take approximately 20 years to reach BMSY levels (42 per cent of unfished biomass). The above evidence indicates that adequate management measures have been put in place to allow the stock to recover from its recruitment impaired state but have not yet resulted in measurable improvement.

On the basis of the evidence provided above, the East Coast Otter Trawl Fishery (Queensland) management unit is classified as a **depleted stock**.

**Shark Bay
Scallop
Managed
Fishery**

For Shark Bay, a quota management system with a conservative TACC, a mid-year review and target reference levels for resumption of fishing was implemented in 2015 to resolve resource sharing issues, provide protection for the breeding stock and aid in recovery following the major decline after the 2010–11 marine heatwave. Catch predictions in Shark Bay for 2019 for the two separate stocks, Denham Sound and northern Shark Bay, were derived from the correlation between the annual landed catch (meat weight) and the mean catch rate (number per nautical mile trawled) of recruit (0+) and residual (1+) scallops for standard survey sites in November. In 2019, no TACC was set for northern Shark Bay due to very low scallop abundance and this part of the fishery is considered to have not recovered. Additional conservative management measures have been implemented each year since 2015 including a limit on the level of scallop harvest pre-spawning complemented by small scale spatial closures to prawn trawling, that in 2019 were aimed at further protecting the northern Shark Bay stocks. Following the March 2019 survey, a total TACC of 350 t meat weight (1 750 t whole weight) for Denham Sound was set (season of 1 March to 28 February) which was an increase on the initial TACC for the season set following the November 2018 survey. Ninety-seven per cent (339 t meat weight and 1 694 t whole weight) of the quota was achieved. The ongoing closure of northern Shark Bay means fishing mortality on this part of the stock is zero. The above evidence indicates that the biomass is unlikely to be depleted and 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, the Shark Bay Scallop Managed Fishery (Western Australia) management unit is classified as a **sustainable stock**.

**South Coast
Trawl
Fishery**

The South Coast Trawl Fishery (Western Australia) management unit is a low-activity fishery in which effort is related to the abundance of Ballot's Saucer Scallop in any given year, which can be highly variable due to sporadic recruitment. The few vessels (up to four) that operate in the fishery only fish over one to three per cent of the allowable fishery area and have not fished in every year. No fishing was undertaken in 2019 (as for 2017 and 2018) [Gaughan and Santoro 2020]. The mean catch rate in this fishery for the previous five years when fishing had taken place was 3 039 kg (whole weight) per boat day,

which is 68 per cent of the maximum catch rate recorded (range 817–4 499 kg per boat day). The above evidence indicates that the biomass of this stock is unlikely to be recruitment overfished. It also indicates that the current level of fishing pressure is unlikely to cause the stock to become recruitment impaired.

On the basis of the evidence provided above, the South Coast Trawl Fishery (Western Australia) management unit is classified as a **sustainable stock**.

South West Trawl Managed Fishery

The South West Trawl Managed Fishery (Western Australia) (SWTMF) management unit is a comparatively small, low-activity fishery in which fishing effort has been related to either the abundance of Western King Prawn or Ballot's Saucer Scallop in any given year, which can be highly variable due to sporadic scallop recruitment. Only one to four vessels have operated in the fishery since 2005 and they have only fished in one to three per cent of the allowable fishery area [Gaughan and Santoro 2020]. Between 2005 and 2014 (no fishing occurred in 2015 and 2016) an average of 168 boat days were recorded annually, with a catch range of between 1–217 t whole weight, compared to 500 boat days on average over the previous 12 years (1993–2004), with a catch range of between 3–27 t whole weight. The above evidence indicates that the biomass of this stock is unlikely to be depleted and that recruitment is unlikely to be impaired.

Only one boat fished in the SWTMF in 2019 for a total of 32 boat days. There are currently eight licences in this fishery, however only one authorised boat fished in 2019. In this fishery, for other boats to be approved to fish, a variation application needs to be approved by the chief executive officer (CEO), or their delegate, and approval is discretionary. For example, the CEO may determine that it is not in the better interests of the fishery (i.e. if potential for a significant activation of latent effort) to vary the authorisation. The above evidence indicates that the fishing pressure is unlikely to cause the stock to become recruitment overfished.

On the basis of the evidence provided above, the South West Trawl Managed Fishery (Western Australia) management unit is classified as a **sustainable stock**.

BIOLOGY

Ballot's Saucer Scallop biology [Heald 1978, Dredge 1981, Williams and Dredge 1981, Joll 1989, Orensanz et al. 2006]

Species	Longevity / Maximum Size	Maturity (50 per cent)
Ballot's Saucer Scallop	Maximum of 4 years and 140 mm SH	At ~1 year of age and 85–90 mm SH

DISTRIBUTION



Commercial catch of Ballot's Saucer Scallop - note confidential catch not shown

TABLES

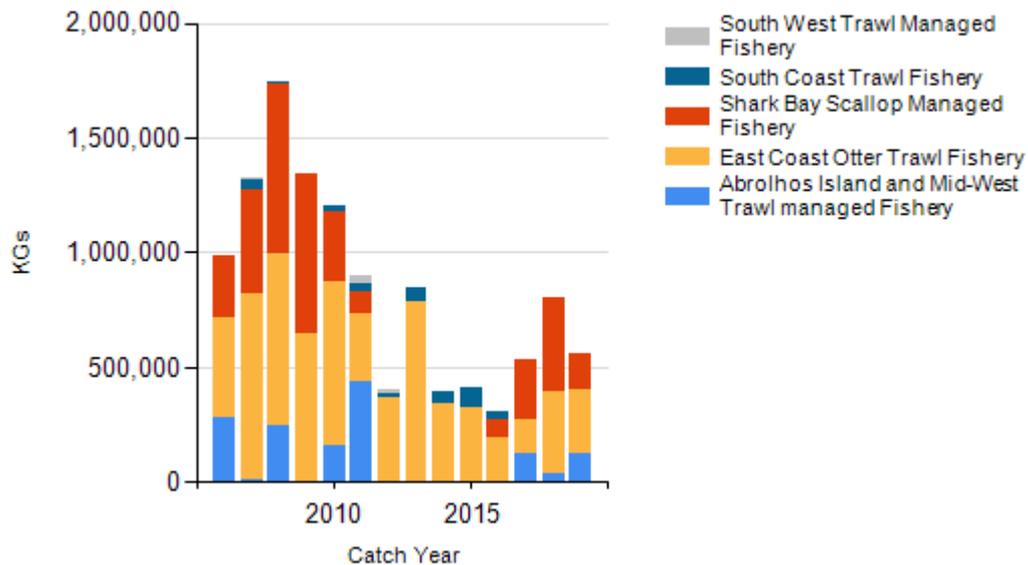
Fishing methods	Queensland	Western Australia
Commercial		
Otter Trawl		✓
Trawl	✓	
Recreational		
Unspecified		✓

Management Methods	Queensland	Western Australia
Commercial		
Catch limits		✓
Effort limits		✓
Limited entry	✓	✓
Seasonal closures	✓	
Size limit	✓	
Spatial closures	✓	✓
Vessel restrictions	✓	

Catch	Queensland	Western Australia
Commercial	276.894 t	282.414 t
Indigenous	No catch	No catch
Recreational	No catch	No catch

Queensland – Indigenous (management methods) for more information see <https://www.daf.qld.gov.au/business-priorities/fisheries/traditional-fishing>

CATCH CHART



Commercial catch of Ballot's Saucer Scallop - note confidential catch not shown

References	
Campbell et al. 2012	Campbell, AB, O'Neill, MF, Leigh GM, Wang Y-G & Jebreen, EJ 2012, Reference points for the Queensland scallop fishery, final report to the Fisheries Research and Development Corporation, project 2009/089, Queensland Department of Employment, Economic Development and Innovation.
Dredge 1981	Dredge, MCL 1981, Reproductive biology of the saucer scallop <i>Amusium japonicum balloti</i> (Bernardi) in central Queensland waters, Australian Journal of Marine and Freshwater Research 32: 775–787.
Gaughan and Santoro 2020	Gaughan, DJ and Santoro K (eds) 2020, State of the fisheries and aquatic resources report 2018/19, Department of Primary Industries and Regional Development, Western Australia.
Heald 1978	Heald, D 1978, A successful marking method for the saucer scallop <i>Amusium balloti</i> (Bernardi), Australian Journal of Marine and Freshwater Research, 29: 845–851.
Joll 1989	Joll, LM 1989, History, biology and management of Western Australian stocks of the saucer scallop <i>Amusium balloti</i> , in MLC Dredge, WF Zacharin and LM Joll (ed.s), Proceedings of the Australasian scallop workshop, Hobart, Tasmania, pp 30–40.
Myrnhardt et al. 2014	Mynhardt, G, Alejandrino, A, Puslednik, L, Corrales, J and Serb, JM 2014, Shell shape convergence masks biological diversity in gliding scallops: description of <i>Ylistrum</i> n. gen. (Pectinidae) from the Indo-Pacific Ocean, Journal of Molluscan Studies, 80: 400–411..

Orensanz et al. 2006	Orensanz, JM, Parma, AM, Turk, T and Valero, J 2006, Dynamics, assessment and management of exploited natural populations, in SE Shumway and GJ Parson (eds), <i>Scallops: biology, ecology and aquaculture</i> , <i>Developments in aquaculture and fisheries science</i> , 35: 765–868.
Williams and Dredge 1981	Williams, ML and Dredge, MCL 1981, Growth of the saucer scallop, <i>Amusium japonicum balloti</i> Habe, in central eastern Queensland, <i>Australian Journal of Marine and Freshwater Research</i> , 32: 657–666.
QFISH 2020	QFish, Department of Agriculture and Fisheries, www.qfish.gov.au
Wortmann et al. 2020	Wortmann, J, O'Neill, MF, Courtney AJ and MJ Yang, WH 2020, Stock assessment of Ballot's saucer scallop (<i>Ylistrum balloti</i>) in Queensland. Technical Report. State of Queensland, Brisbane.
DPIRD 2020	Saucer Scallop Resource of Shark Bay Harvest Strategy 2020-2025, Fisheries Management Paper 301:39 pp. Department of Primary Industries and Regional Development, Western Australia.