Ballot's Saucer Scallop (2023)

Ylistrum balloti

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STOCK STATUS OVERVIEW

Jurisdiction	Stock	Stock status	Indicators
Western Australia	Abrolhos 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 (age structured population model), estimated biomass, fishery independent abundance survey, CPUE

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. However, Ballot's Saucer Scallops only occur in high abundance in parts of this extensive range. Within these areas of higher abundance, scallop recruitment is

also highly variable, both seasonally and spatially. 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. In general, saucer scallops in the main fishing ground (latitude 22°–27° south) form a single stock, although there is some evidence to suggest that saucer scallop on the fishing ground east of K'gari (formerly Fraser Island), are less connected to those on the fishing grounds between Yeppoon and Hervey Bay [Dredge 2006; Wortmann et al. 2022]. No fishery for Ballot's Saucer Scallop exists in New South Wales waters. The stock status classification presented here is based on information from the commercial fishery in southern Queensland where the majority of scallops on the east coast 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 a Marine Stewardship Council (MSC) certified fishery 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/nautical mile (nm)) [DPIRD 2020; Kangas et al. 2023].

The pre-season fishery independent survey index (November 2021) of 45 scallop/nm was well below the limit reference level of 250 scallops/nm resulting in the closure of the fishery for the 2022 season. A follow up stock survey during February 2022 indicated improved stock biomass at 1,021 scallops/nm which was mainly small recruits that would become the harvestable scallops for the 2023 fishing season. The decline in the 2022 recruitment cohort is likely related to the above-average water temperatures over the 2021–22 summer spawning period and a moderate marine heatwave event during January 2021 that impacted the Abrolhos Islands region. Together with a stronger than average Leeuwin Current associated with the 2021–22 La Niña event, environmental conditions for below average scallop recruitment were evident [Chandrapavan et al. 2020].

Although the pre-season survey index in late 2021 led to the closure of the fishery during 2022, the subsequent stock survey in early 2022 indicated that ongoing recruitment was unlikely to be impaired and biomass is not likely to be depleted. These findings led to the resumption of commercial fishing during 2023. The effort constraints in place under the Harvest Strategy also indicate 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 saucer scallop fishing year is defined as November of the preceding year to October of the named year and catch and effort is given in fishing year unless otherwise labelled. The annual catch of Ballot's Saucer Scallop declined from higher levels in 2001 when annual harvests of legal sized scallops were generally greater than or equal to 800 tonnes (t) meat weight to an average of 211 t over the last 5 years (2017–2022), prior to the closure in late 2021 [French 2023]. After the closure of the main fishing grounds, catch for this stock decreased to around 13 t in 2022.

The most recent update to the stock assessment [French 2023] estimated that the spawning stock biomass of the southern inshore and offshore trawl regions in 2022 was 15% of 1956 unfished levels. The assessment indicated that biomass declined to 10% of unfished biomass between 1956 and 2016. The main fishing grounds will remain closed until spawning stock biomass reaches 30% of unfished levels [QDAF 2021].

Commercial-sized scallop density (number of legal-sized scallops per hectare in October) from a fishery-independent survey decreased from 45 to 10 scallops per hectare from 2021 to 2022 [French 2023]. Standardised catch rates were on average 5 baskets per boat per day (southern inshore and offshore) for November 2021–January 2022 and up to 17 baskets per day in February 2022.

It is notable that scallop spawning success and survival is associated with environmental conditions, in particular sea surface temperatures (SST). Above-average winter SST are negatively associated with scallop catch rates during the next season [O'Neil et al. 2020]. However, high SST, like those observed in Western Australia in 2010–11 have not been observed in Queensland [Wortmann et al. 2022]. Environmental conditions may impact the recovery of this stock. Of importance, Wortmann et al. [2022] notes that if natural mortality increases with SST, then it may affect target reference points used for managing fishing effort. 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 and scallop replenishment areas (SRAs) were first introduced. There are six SRAs located off Yeppoon, Bustard Head and Hervey Bay. The SRAs operated on a rotational system from the early 2000s and were permanently closed in January 2017 due to depletion. Following this, the main fishing grounds were permanently closed in late 2021. The closure was in response to the low biomass levels found in consecutive stock assessments, the 2022 stock assessment proposed a catch of zero t and estimated that it would take 10 years to rebuild to 40% of unfished biomass [Wortmann et al. 2022]. The 2022 harvest of around 13 t is below the 234 t that represents equilibrium harvest at 15% biomass [French 2023]. 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

Shark Bay operates under a quota management system with a conservative total allowable commercial catch (TACC) with a mid-year review, and target reference levels that were implemented in 2015 to resolve resource sharing issues, provide protection for the breeding stock, and aid stock recovery following a major decline after the 2010–11 extreme marine heatwave event [Kangas et al 2023]. Within Shark Bay there are two biological stocks, Denham Sound and Northern Shark Bay, each with their individual TACCs that include a pre-spawning limit (40% of the TACC). A 12-month fishing season operates from 1 May to April 30 with a spawning closure during June/July, and a number of other spatial closures that relate specifically to the dedicated scallop and prawn fleets. Three fishery-independent surveys are undertaken during February, June, and November to inform the harvest strategy and assess stock status.

The Northern Shark Bay stock, which was once the most productive stock in WA with average catch landings around 500 t (meat weight), has experienced limited, inconsistent stock recovery since 2012. In years where above-average recruitment has occurred, there has been poor survival and growth of those recruits to adult sizes. A combination of spatial and temporal management measures has been attempted to provide increased stock protection and thereby allow overall biomass and fishery productivity to increase. In November 2020 however, results from the fishery independent survey indicated good survival and growth of recruits within a small area of Northern Shark Bay. This allowed for a quota allocation of 85 t that was harvested at the beginning of the 2021–22 season. Recruitment and stock levels have continued to improve throughout 2023 in selected regions of Northern Shark Bay. A mid-season review of the stock led to the TACC being increased from 45 to 100 t for the remainder of the 2023–24 fishing season.

The Denham Sound scallop stock recovered much faster than that in Northern Shark Bay and catch landings have ranged between 30–300 t between 2015 and 2022. Based on the November 2022 survey index of 409 scallops/nm (threshold level being 160 scallops/nm), a TACC of 120 tonnes was set for the 2023–24 fishing season. The above evidence indicates that the biomass of this stock is unlikely to be depleted and recruitment is unlikely to be impaired. 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 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. Three vessels fished in 2022 for a total of 57 days [Kangas et al. 2023]. The mean catch rate in this fishery for the period 2014–18, when fishing had taken place was, 3,039 kg (whole weight) per boat day, which is 68% 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 become depleted and recruitment is unlikely to be impaired. 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 the annual fishing effort has mainly reflected either the abundance of Western King Prawns or Ballot's Saucer Scallops in any given year, the latter of which can be highly variable in abundance 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 [Kangas et al. 2023]. 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.

There are currently eight licenses in this fishery, however only one boat fished in the SWTMF in 2022 for a total of 12 boat days. The above evidence indicates that the fishing pressure is unlikely to cause the stock to become depleted.

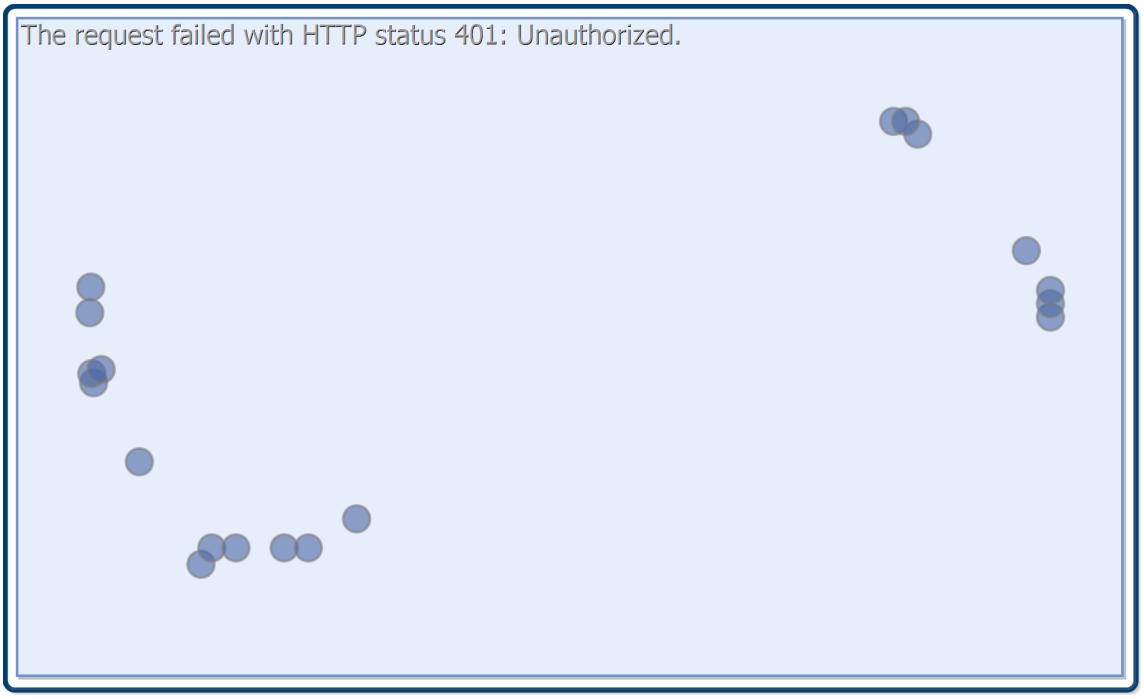
On the basis of the evidence provided above, the South West Trawl Managed Fishery (Western Australia) management unit is classified as a **sustainable stock.**

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 around one 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	✓	✓
Recreational		
Unspecified		✓

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

Vessel restrictions	✓	

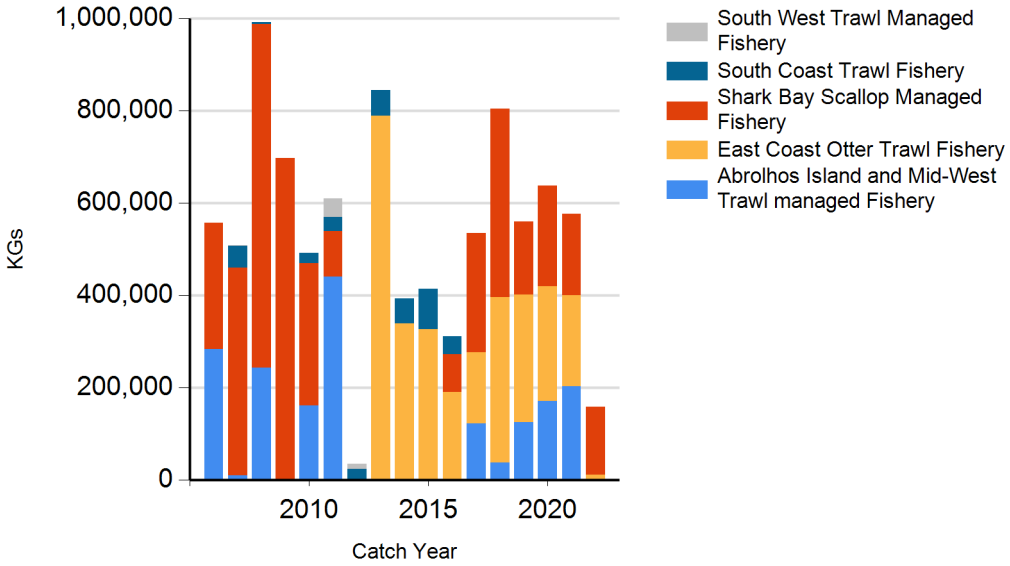
Catch		
	Queensland	**Western Australia**
Commercial	11.501 t	147.07 t
Indigenous	No catch	No catch
Recreational	No catch	No catch

Queensland – Commercial (Catch). Queensland commercial and data have been sourced from the commercial fisheries logbook program. Further information available through the Queensland Fisheries Summary Report https://www.daf.qld.gov.au/business-priorities/fisheries/monitoring-research/data/queensland-fisheries-summary-report

Queensland – Commercial (Management Methods). Harvest strategies are available at: https://www.daf.qld.gov.au/business-priorities/fisheries/sustainable/harvest-strategy

Queensland – Commercial (Catch). Catch table data have been provided in financial year format.

CATCH CHART



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

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