

# Commercial Scallop (2018)

*Pecten fumatus*



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## STOCK STATUS OVERVIEW

Jurisdiction	Stock	Fisheries	Stock status	Indicators
Commonwealth	Bass Strait Central Zone Scallop Fishery	BSCZSF	Sustainable	Biomass surveys, size composition, catch
Victoria	Ocean Scallop Fishery	OSF	Depleted	Biomass surveys, catch
Victoria	Port Phillip Bay Dive Scallop Fishery	PPBDSF	Sustainable	Biomass surveys, size composition, catch
Tasmania	Tasmania Scallop Fishery	TSF	Depleted	Biomass surveys, size composition, catch

BSCZSF Bass Strait Central Zone Scallop Fishery (CTH), TSF Tasmanian Scallop Fishery (TAS), OSF Ocean Scallop Fishery (VIC), PPBDSF Port Phillip Bay Dive Scallop Fishery (VIC)

## STOCK STRUCTURE

There are several Commercial Scallop beds fished commercially in Commonwealth, Victorian and Tasmanian waters. These beds often contain different age classes of scallop and most have been fished at some stage in the past. Commercial Scallops in Port Phillip Bay (Victoria) and D'Entrecasteaux Channel (Tasmania) are genetically distinct from conspecifics in most other locations in south eastern Australia [Ovenden et al. 2016, Semmens et al 2015, Woodburn 1990]. Beds in north eastern Bass Strait are also genetically distinct to adjacent Bass Strait beds and may not contribute to wider recruitment based on biophysical models of larval movement [Ovenden et al. 2016]. Here, assessment of stock status is reported at the management unit level—Bass Strait Central Zone Scallop Fishery (Commonwealth), Ocean Scallop Fishery (Victoria), Port Phillip Bay Dive Scallop Fishery (Victoria) and Tasmania Scallop Fishery.

## STOCK STATUS

**Bass Strait  
Central  
Zone  
Scallop  
Fishery**

Commercial Scallops in the Bass Strait Central Zone Scallop Fishery were considered recruitment overfished between 1999 and 2007. Following three years of closure due to low scallop abundance and concerns about overfishing, the fishery was reopened in 2009, under a new harvest strategy [AFMA 2007]. Commercial Scallops experienced die-offs in 2010–11 and the harvest strategy was revised in 2012 [AFMA 2012], 2014 [AFMA 2014] and 2015 [AFMA 2015]. Between 2009 and 2013 the fishery operated north of Flinders Island and since 2014 it has operated east of King Island.

Elements of the current Commonwealth harvest strategy include: a tiered management approach (whereby a 150 tonnes (t) TAC can be set as a 'default opening' TAC, covering the whole BSCZSF management area, to allow operator to search widely for scallop beds. Tier 1 of the harvest strategy states that if the scientific survey identifies one or more scallop bed(s) with a combined biomass of 1 500 t or more, with scallops greater than 85 mm in length and in 'high' density, and these beds are closed to commercial fishing, the TAC can be stepped up to a maximum of 2 000 t. Tier 2 of the harvest strategy states that if the scientific survey identifies one or more scallop bed(s) with a combined biomass of 3 000 t or more, and these beds are closed to commercial fishing, the TAC can be initially set to at least 2 000 t.

Surveys in 2017 covered eight beds around King Island with a combined adult biomass of 21 700 t and an additional four beds around Flinders Island with a combined biomass of 1 100 t [Knuckey et al. 2017]. The Flinders Island beds have not been commercially fished since 2014, and it appears there has been considerable mortality in these beds. These beds were closed for the 2017 season.

The 2017 fishery opened on 11 July 2017 with a starting TAC of 3 000 t. Fishing generally focused on the same areas as the 2014–16 seasons (that is, east of King Island), and operators reported scallops in good condition. The fishery closed on 31 December 2017 with 2 964 t of the 3 000 t TAC landed.

Compared with previous surveys, a relatively large biomass of 26 000 t was surveyed in the BSCZSF in 2016 [Knuckey et al. 2016] and 22 800 t in 2017 [Knuckey et al. 2015], centred in the west. These estimates are comparable to the very large historical annual catches taken from the fishery at its peak (24 000 t in 1983), when the fleet was much larger and catches were unconstrained. Additionally, the escapement (the percentage of the known biomass not caught in a year) has been high in recent years for western Bass Strait (86 per cent in 2017, 87 per cent in 2016 and 76 per cent in 2015). Since fishing has not occurred in eastern Bass Strait in these three years, escapement there was 100 per cent.

As indicated above, the management of scallops is complex with a high degree of variation in recruitment from year to year and the need to manage individual scallop beds across the fishery. However, recent survey and catch information indicates that the biomass is currently not depleted in managed areas across the fishery and that recruitment has not been impaired in these areas. It is very difficult to predict future recruitment in scallop fisheries. The current management arrangements are designed to maintain areas of healthy biomass and on this basis minimise the chance of the stock becoming recruitment impaired.

On the basis of the evidence provided above, the Bass Strait Central Zone Scallop Fishery (Commonwealth) management unit is classified as a **sustainable stock**.

**Ocean  
Scallop  
Fishery**

The Victorian Scallop (Ocean) Fishery extends out from the coastline to 20 nautical miles. Since the commercial fishery began in the 1970s, catches have varied greatly from year to year. Prompted by poor catches during the mid-to

late-2000s, fishery independent surveys of historically fished scallop beds in 2009 [Harrington et al. 2010] and 2012 [Semmens and Jones 2012] found low scallop densities and negligible recruitment. Consequently, the TAC for the 2010–11, 2011–12 and 2012–13 fishing seasons was set at zero. A TAC of 135 t was set for the following four seasons to allow limited exploratory fishing and determine if there had been any stock recovery. Only a small portion of the 135 t TAC has been harvested during this time with zero catch reported for the 2017–18 season.

A further abundance survey covering the historical fishing grounds in eastern Victoria was undertaken in late December 2017 and early January 2018 [Koopman et al. 2018]. Results from this survey have indicated a continued low level of abundance and recruitment throughout the fishery. Whilst the survey did locate a very small number of beds containing commercially available scallops, they were not at a level or density considered sufficient to provide ongoing recruitment to the fishery.

The scallop bed containing the highest abundance of adult scallops greater than the legal minimum length of 80 mm located during the survey had an estimated biomass of 386 t. The density of this bed was estimated at 0.51 individuals per m<sup>2</sup>. Aligning with the Bass Strait Central Zone Commercial Scallop fishery harvest strategy [AFMA 2014] an area containing a minimum abundance estimate of 1 500 t adult spawning stock of high density (above 0.2 individuals per m<sup>2</sup>) is recognised as being sufficient to maintain ongoing recruitment in a scallop fishery.

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 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. Environmental factors appear to have prevented such recovery rather than the effects of fishing and a cautious approach has been implemented to support recovery.

On the basis of the evidence provided above, the Ocean Scallop Fishery (Victoria) management unit is classified as a **depleted stock**.

### **Port Phillip Bay Dive Scallop Fishery**

Dredging for Commercial Scallops in Port Phillip Bay ceased in 1997. A single licence was issued for the take of Commercial Scallop in a new Port Phillip Bay Dive Scallop Fishery in 2013. A survey conducted in 2014 estimated that the total harvestable biomass of Commercial Scallops within fishable areas of Port Phillip Bay was 3 629 t [DEPI 2014]. A TACC equating to four per cent of the estimated harvestable biomass (146 t) was then set for the 2015–16 fishing season (1 April–30 March), and further increased to 250 t during 2016–17 in line with revised estimates of biomass from surveys [Gwyther 2015]. In 2017–18 the TACC for the Scallop Dive (Port Phillip Bay) Fishery was set at 60 t, or < 2 per cent of estimated biomass, when it became clear the TACC was far in excess of annual catches.

A conservative TACC, combined with the protection afforded by a minimum legal size (90 mm shell length [DEDJTR 2016]).

Recreational fishing for Commercial Scallops is popular off the coast of the Bellarine Peninsula between Portarlington and St. Leonards, and to the north of the Mornington Peninsula from Point Nepean to Dromana [DEPI 2013]. While there are no current estimates of the recreational take of Commercial Scallop in Victorian waters, a survey in 2000–01 estimated that it was in the order of 5.7 t [Henry and Lyle 2003].

The above evidence indicates that the biomass of this stock is unlikely to be depleted, recruitment is unlikely to be impaired, and 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 Port Phillip Bay Dive Scallop Fishery (Victoria) management unit is classified as a **sustainable stock**.

**Tasmania  
Scallop  
Fishery**

The harvest of Commercial Scallop in Tasmania waters is regulated through a minimum size limit of 90 mm SL; animals of this size are approximately  $\geq 3$  years of age and have spawned at least twice [Young et al. 1989].

The Tasmania Scallop Fishery is managed under a harvest strategy where surveys are undertaken to estimate abundance and decision rules are used to open an area (or areas) to fishing with TACs based on the estimated abundance. Similar to the Commonwealth fishery, these decision rules include a minimum size limit and a maximum discard rate (which is not to exceed 20 per cent). However, unlike the Bass Strait Central Zone Scallop Fishery (Commonwealth) (BSCZSF), there is no requirement to close a proportion of the beds found during surveys. Instead, protection of scallop habitat, which may contain scallop beds, is afforded through a ban on scallop dredging in waters less than 20 m and a network of dredge-prohibited areas around the state.

Biomass in the Tasmanian Scallop Fishery (TSF) is historically overfished with recruitment and production levels now affected. In 2013, 2014 and 2015, surveys generally found low scallop densities and limited evidence of successful recent recruitment but did identify two beds (one on the north west coast and the other on the east coast) containing commercial quantities [Semmens et al. 2018]. Surveys in 2016 and again in 2017 generally only found very low levels of scallop abundance and limited evidence of successful recruitment, with no area considered to contain commercially viable quantities in either year. This includes the east and north-west coast beds fished in 2013–15, which appeared to have been fished down to a commercially unviable density, with no subsequent recruitment evident.

Fishing mortality is managed with the aim of restricting catches to beds of mature scallops near the end of their lifespan. The combination of the harvest strategy and depleted biomass has led to a history of closures due to low abundance. In recent times, the fishery was closed between 2000–02 and again between 2009 and 2010. Areas with commercial density of scallops towards the end of their lifespan were opened to fishing each year between 2013 and 2015. The harvest strategy appears to prevent overfishing as occurred historically.

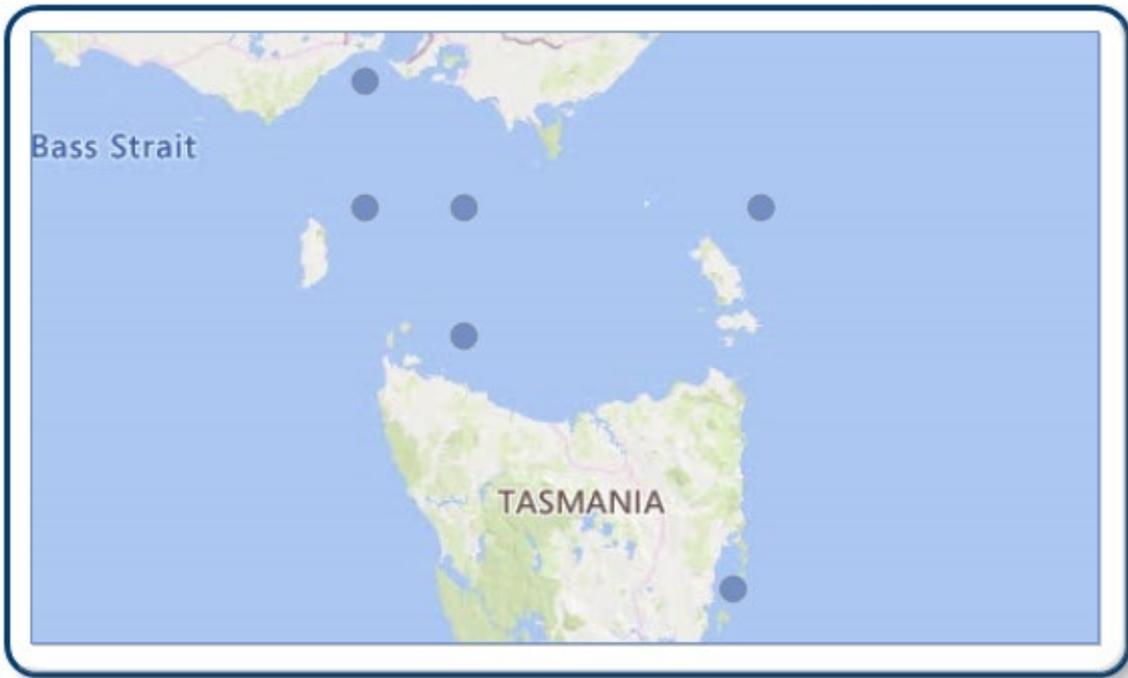
The above evidence indicates that the biomass is depleted and recruitment has been impaired. The current restrictions of fishing mortality have not yet led to evidence of recovery or recruitment. On the basis of the evidence above, the Tasmania Scallop Fishery management unit is classified as a **depleted stock**.

**BIOLOGY**

**Commercial Scallop biology** [Ovenden et al. 2016, Semmens et al. 2015, Woodburn 1990, Young, et al. 1989]

Species	Longevity / Maximum Size	Maturity (50 per cent)
Commercial Scallop	7+ years, > 120 mm SL	2 years, 70–80 mm SL , depending on region

**DISTRIBUTION**



Distribution of reported commercial catch of Commercial Scallop

**TABLES**

<b>Commercial Catch Methods</b>	<b>Commonwealth</b>	<b>Tasmania</b>	<b>Victoria</b>
Dredges	✓	✓	✓
Unspecified		✓	✓

<b>Fishing methods</b>	<b>Commonwealth</b>	<b>Tasmania</b>	<b>Victoria</b>
<b>Charter</b>			
Diving			✓
Hand held-Implement s			✓
<b>Commercial</b>			
Dredges	✓	✓	✓
Unspecified		✓	
<b>Indigenous</b>			
Diving		✓	
<b>Recreational</b>			
Diving		✓	✓
Hand held-Implement s			✓

<b>Management Methods</b>	<b>Commonwealth</b>	<b>Tasmania</b>	<b>Victoria</b>
<b>Charter</b>			

Bag and possession limits			✓
Licence			✓
Spatial closures			✓
<b>Commercial</b>			
Effort limits			✓
Gear restrictions	✓	✓	✓
Licence		✓	✓
Limited entry	✓	✓	✓
Size limit	✓	✓	✓
Spatial closures	✓	✓	✓
Temporal closures	✓	✓	
Total allowable catch	✓	✓	✓
<b>Indigenous</b>			
Bag limits		✓	
Customary fishing permits			✓
Size limit		✓	
Spatial closures		✓	
Temporal closures		✓	
<b>Recreational</b>			
Bag and possession limits			✓
Bag limits		✓	
Licence			✓
Size limit		✓	
Spatial closures		✓	✓
Temporal closures		✓	

<b>Active Vessels</b>	
	<b>Commonwealth</b>
	12 Vessels in BSCZSF,

BSCZSF Bass Strait Central Zone Scallop Fishery(CTH)

<b>Catch</b>			
	<b>Commonwealth</b>	<b>Tasmania</b>	<b>Victoria</b>

<b>Commercial</b>	2964.02t in BSCZSF,	16.257t in TSF,	
<b>Indigenous</b>	No Catch	Unknown	Unknown (No catch under permit)
<b>Recreational</b>	No Catch	Unknown	Unknown

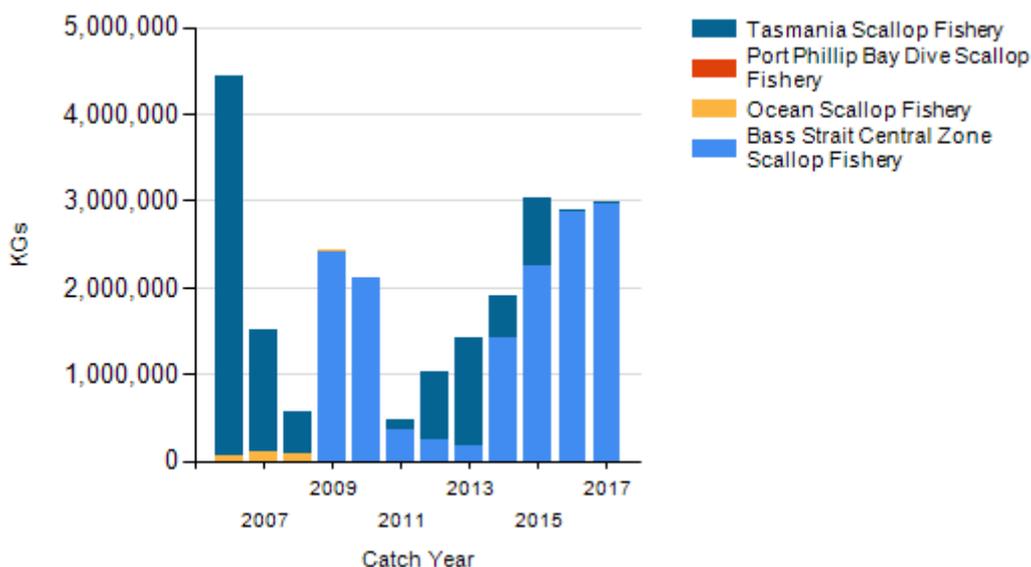
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**Commonwealth catch** is presented for 2017.

**Victoria – Commercial (catch)** (a) To protect commercial confidentiality of data, the catch in the Ocean Scallop Fishery (Victoria) and Port Phillip Bay Dive Scallop Fishery (Victoria) cannot be reported because there are fewer than five licence holders; and (b) In Victoria, the reporting period is fishing season, which runs from 1 April–30 March.

**Victoria – Indigenous (Management Methods)** In Victoria, regulations for managing recreational fishing may not apply to fishing activities by Indigenous people. Victorian traditional owners may have rights under the *Commonwealth's Native Title Act 1993* to hunt, fish, gather and conduct other cultural activities for their personal, domestic or non-commercial communal needs without the need to obtain a licence. Traditional Owners that have agreements under the *Traditional Owner Settlement Act 2010* (Vic) may also be authorised to fish without the requirement to hold a recreational fishing licence. Outside of these arrangements, Indigenous Victorians can apply for permits under the *Fisheries Act 1995* (Vic) that authorise fishing for specific Indigenous cultural ceremonies or events (for example, different catch and size limits or equipment). There were no Indigenous permits granted in 2017 and hence no Indigenous catch recorded.

## CATCH CHART



Commercial catch of Commercial Scallop - note confidential catch not shown.

## EFFECTS OF FISHING ON THE MARINE ENVIRONMENT

### ENVIRONMENTAL EFFECTS on Commercial Scallop

#### References

421	Australian Fisheries Management Authority 2007, Harvest strategy for the Bass Strait Central Zone Scallop Fishery. Australian Fisheries Management Authority: Canberra.
422	Australian Fisheries Management Authority 2012, Harvest strategy for the Bass Strait Central Zone Scallop Fishery. Australian Fisheries Management Authority: Canberra.
423	Australian Fisheries Management Authority 2014, Harvest Strategy for the Bass Strait Central Zone Scallop Fishery. Australian Fisheries Management Authority: Canberra.
424	Australian Fisheries Management Authority 2015, Harvest Strategy for the Bass Strait Central Zone Scallop Fishery. Australian Fisheries Management Authority: Canberra.
425	DEDJTR 2016, Draft Port Phillip Scallop Dive Fishery Management Plan. Fisheries Victoria: Melbourne.
426	DEPI 2013, Commercial Scallop Dive Fishery (Port Phillip Bay) Baseline Management Arrangements. Fisheries Victoria: Melbourne.
427	DEPI 2014, Commercial Scallop Dive Fishery (Port Phillip) – Survey Results for 2014. Fisheries Victoria: Melbourne
428	Gwyther, D 2015, Review of The TACC For the Dive Fishery for Scallops in Port Phillip Bay – Report to Port Phillip Bay Scallops, 27 March 2015. Melbourne: Picton Group Pty Ltd, 6 pp.
429	Harrington, J, Leporati, S and Semmens, JM 2010, 2009 Victorian Scallop Fishery Survey, final report to Fisheries Victoria. Tasmanian Aquaculture and Fisheries Institute, University of Tasmania: Hobart.
430	Henry, GW and Lyle, JM 2003, The National Recreational and Indigenous Fishing Survey - project 99/158 FRDC: Canberra.
431	Knuckey, I, Koopman, M and Davis, M 2015, Bass Strait and Central Zone Scallop Fishery — 2015 Survey, project 2015/001291. Australian Fisheries Management Authority: Canberra.
432	Knuckey, I, Koopman, M, Hudson, R, Davis, M and Sullivan, A 2017, Bass Strait and Central Zone Scallop Fishery — 2017 Survey, project 2016/0806, Australian Fisheries Management Authority: Canberra. Australian Fisheries Management Authority 2015, Bass Strait Central Zone Scallop Fishery Resource Assessment Group (ScallopRAG) Meeting 23, Meeting Minutes; Date: 2 March 2015. AFMA: Canberra.
433	Koopman, M, Knuckey, I, Harris, M and Hudson, R 2018, Eastern Victorian Ocean Scallop Fishery – 2017-18 Abundance Survey. Report to the Victorian Fisheries Authority. Fishwell Consulting. 42pp.
434	Ovenden, JR, Tillett, BJ, Macbeth, M, Broderick, D, Filardo, F, Street, R, Tracey, SR and Semmens, J 2016, Stirred but not shaken: population and recruitment genetics of the scallop ( <i>Pecten fumatus</i> ) in Bass Strait, Australia. ICES Journal of Marine Science: Journal du Conseil.
435	Peterson, CH, Summerson, HC and Fegley, SR 1988, Ecological consequences of mechanical harvesting of clams. Fishery Bulletin, 85(2): p. 281–298.
436	Semmens, JM and Jones, N 2012, Victorian scallop fishery survey final report. Institute for Marine and Antarctic Studies, University of Tasmania: Hobart.
437	Semmens, JM, Ovenden, JR, Jones, NAR, Mendo, TC, Macbeth, M, Broderick, D, Filardo, F, Street, R, Tracey, SR and Buxton, CD 2015, Establishing fine-scale industry based spatial management and harvest strategies for the Commercial Scallop fishery in South East Australia, final report to the Fisheries Research and Development Corporation, project 2008/022. FRDC: Canberra.
438	Semmens, J, Ewing, G and Keane J 2018, Tasmanian Scallop Fishery Assessment 2017. Institute for Marine and Antarctic Studies. 34p.
439	Woodburn, L 1990, Genetic variation in southern Australian <i>Pecten</i> , in Proceedings of the Australasian Scallop Workshop. Tasmanian Government: Hobart.
440	Young, P and Martin, R 1989, The scallop fisheries of Australia and their management. Reviews in Aquatic Sciences, 1(4): p. 615-638.