

BALMAIN BUGS (2023)

Ibacus peronii, *Ibacus brucei*, *Ibacus chacei*, *Ibacus alticrenatus*, *Ibacus* spp.



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STOCK STATUS OVERVIEW

Jurisdiction	Stock	Stock status	Indicators
Western Australia	Western Australia	Negligible	
Queensland, New South Wales	East Coast	Sustainable	Catch rates, catch, effort, size structure, risk assessment
Victoria	Victoria	Undefined	Catch
South Australia	South Australia	Undefined	

STOCK STRUCTURE

The common name 'Balmain Bug' refers to four similar species of fan lobster: *Ibacus alticrenatus*, *I. brucei*, *I. chacei* and *I. peronii* [Haddy et al. 2007]. These species distributions partially overlap on the east coast of Australia and have evolved different life-history strategies, tending to occupy different depth ranges. However, here, they are assessed as a single species group because they are rarely distinguished by fishers or fish marketers.

The true Balmain Bug (*I. peronii*) is widely distributed around the southern half of the continent, from around the Queensland—New South Wales border (latitude 28°S) to central Western Australia (latitude 29°S), including the east coast of Tasmania and Bass Strait. The true Balmain Bug is mainly found close to shore, in waters less than 80 m deep. The Smooth Bug (*I. chacei*) is distributed between northern Queensland (latitude 17°S) and southern New South Wales (latitude 36°S), although it is rarely caught south of Sydney (latitude 34°S). It is most abundant on the mid-continental shelf in depths of 50–150 m. The Honey Bug (*I. brucei*) is distributed between central Queensland and northern New South Wales. It is most abundant on the outer continental shelf and upper slope in waters from 120–300 m deep. The Deepwater

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Bug (*I. alticrenatus*) is distributed throughout southern Australian and New Zealand waters. It is most abundant at depths of 200–400 m on the upper continental slope, and stock structure remains unknown [Haddy et al. 2007].

Given the prevailing influence of the East Australian Current along the east coast out to 150 m depth, a protracted pelagic larval phase and a northerly migration of older stages, true Balmain Bugs, Smooth Bugs and Honey Bugs are thought to each constitute single biological stocks across Queensland and New South Wales [Haddy et al. 2007].

Landings in Victoria, South Australia and Western Australia are thought to be predominantly true Balmain Bugs (*I. peronii*). However, the stock relationship between Balmain Bugs caught in these jurisdictions and those caught off New South Wales and Queensland is unknown. Stock status in these jurisdictions is therefore presented at the jurisdictional level.

For the above reasons, assessment of stock status is presented at the jurisdictional level for Western Australian; Victoria; and South Australia, and at the biological stock level for the East Coast (Queensland and New South Wales).

STOCK STATUS

East Coast In Queensland, Balmain Bugs are retained as a by-product and/or Tier 2 species in the East Coast Otter Trawl Fishery (ECOTF). The historical catch for Balmain Bugs peaked in 2005–06 at 112 tonnes (t) with 7,851 reported effort days. Nominal catch rates declined between 2011–12 and 2017–18 and have remained stable since, the exception being in 2020–21 when 92 t of Balmain Bugs were retained (the highest annual catch since 2011–12). Landings decreased the following financial year, with approximately 60 t reported—an 18% reduction compared to the 2000–01 to 2020–21 average of 73 t per year. At the complex level, Balmain Bug effort has consistently declined since 2011–12, from approximately 8,122 days at its peak to an average of 4,921 in the last five years (2017–18 to 2021–22). Effort days in 2021–22 were below average at 3,712 days. Whilst showing a degree of inter-year variability, annual catch levels since the peak have shown a simultaneous decline with effort. This decline in catch and effort is partly attributed to a change in catch reporting requirements and a shift to species-specific reporting. The above evidence indicates that the biomass of the Queensland part of the East Coast stock is unlikely to be depleted and that recruitment is unlikely to be impaired.

The 2015 ecological risk assessment (ERA) of the ECOTF determined that Balmain Bugs were at low risk from trawl fishing activities in regions where they are most likely to be retained, namely southern Queensland [Jacobsen et al. 2015]. Effort levels have remained below the 2009 fishing season (2009 was the reference year used in the 2015 ERA for the Southern Queensland East Coast Otter Trawl Fishery and River and Inshore Beam Trawl Fishery) with the exception of 2012 [Jacobsen et al. 2015]. Balmain Bug fishing mortality is managed by a prohibition on the landing of egg-bearing females; a conservative minimum legal size (MLS) and mandatory use of turtle excluder devices and bycatch reduction devices. These measures lower the incidental catch rates of scyllarid lobsters, including Balmain Bugs [Courtney et al. 2007; Courtney et al. 2008]. In addition, the spawning stock will be provided with some protection from fishing through broader temporal and spatial closures applied at a whole of fishery and regional level.

The evidence provided above suggests that the risk of recruitment overfishing is equal to the previous SAFS assessment. However, since the previous

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assessment, Balmain bugs have been classified as Tier 2 or Tier 3 species (depending on the trawl fishery region) and risk is being managed through regional harvest strategies with decision rules and trigger limits. Species differentiation for the Balmain Bug complex has improved with the introduction of an updated species-specific logbook on 1 September 2021. These changes will assist in terms of quantifying harvest rates and species compositions for Balmain Bugs on the Queensland east coast. The above evidence indicates that the current level of fishing pressure is unlikely to cause the Queensland part of the East Coast stock to become recruitment impaired.

In New South Wales the assessment of stock status for the Balmain Bug species complex is complicated by comprising all four species, and acknowledges the risks associated with masking declines in any single species. However, it is unlikely that the fishery has caused unseen declines in the abundance of either *I. brucei* or *I. alticrenatus* due to limited trawling in their habitats and resulting limited catches in recent times [Stewart 2023]. The bulk of the landed catch in New South Wales is *I. chacei*, estimated to comprise around 85% of the catch during 2021–22 [Stewart et al. 2022]. Balmain Bugs in New South Wales are assessed in terms of their commercial catch, fishing effort, catch rates and length compositions in landings. Nominal median catch rates (kg per day in the ocean prawn trawl fishery) since 1990–91 show signs of cyclical variability, with an overall increasing trend, in particular from 2017–18 to 2021–22. Standardised catch rates also indicate a substantial increase during these four recent years [Stewart 2023]. The sizes of landed *I. chacei* since 2005–06 have remained remarkably consistent and infers stability in exploitable biomass of this species. The relative abundance of larger (greater than 65 mm carapace length) *I. peronii* has declined since 2011–12 which could indicate that the biomass has been fished down [Stewart 2023]. The cause of this change in size composition in the landed catch warrants further investigation; however, it is likely driven by a change in the operation of the fishery with the fleet tending towards fishing in slightly deeper waters when targeting eastern king prawns [Stewart 2023]. The above evidence indicates that the biomass of the New South Wales part of the East Coast stock is unlikely to be depleted and that recruitment is unlikely to be impaired.

The average landed catch during the most recent five years (2017–18 to 2021–22) has been approximately 55 t per year, and below the maximum sustainable yield (MSY) of 59 t per year estimated by Smith et al. (2021). New South Wales reported catch in 2019–20 of 65 t exceeded this estimate, and landings during the 1990s were at times double this estimate of MSY [Stewart 2013]. Declines in landed catch and fishing effort infer declines in fishing mortality following the early 2000s; however, increases in catch and effort in the offshore fishery [Stewart 2013] suggest fishing mortality may have increased in this sector during the previous few years. Management of Balmain Bugs in New South Wales supports adequate reproduction to maintain the stock through a minimum legal size of 100 mm carapace width to protect juveniles [Stewart et al. 1997] and a prohibition on landing egg-bearing individuals. Survival of discarded juveniles is thought to be very high [Wassenberg and Hill 1989] and trawling effort on the inshore grounds continues to decline. Fishing mortality on Balmain Bugs in New South Wales is therefore constrained to sustainable levels. The above evidence indicates that the current level of fishing pressure is unlikely to cause the New South Wales part of the East Coast stock to become recruitment impaired.

On the basis of the evidence provided above, the entire East Coast biological stock is classified as a **sustainable stock**.

**South
Australia**

South Australia's commercial catch of Balmain Bugs over the past 19 years has been less than 8.5 t per annum, and the species is not a major component of recreational landings. There is no published assessment of this species, 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. This prevents 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 evidence provided above, the South Australia Fishery management unit for this species is classified as an **undefined stock**.

Victoria

In Victoria Balmain Bugs are caught as a small part of the commercial inshore trawl fishery, mainly off Gippsland in eastern Victoria. This fishery has produced more than 99% of the catch of Balmain Bugs since 2000. The Victorian jurisdictional Balmain Bug fishery is data limited as the species is mainly a by-product of the inshore trawl fishery and annual catches have been consistently low (less than 20 t per year), averaging 12.3 t per year (over the period from 2000–01 to 2021–22). Recreational catch is unknown.

On the basis of the evidence provided above, Balmain Bugs in the Victorian jurisdiction is classified as an **undefined stock**.

**Western
Australia**

Stock status for the Western Australian jurisdictional stock is reported as **negligible** due to historically low catches in this jurisdiction and because the stock has generally not been subject to targeted fishing. Western Australian commercial catch in the period from 2010–22 averaged less than 200 kg per annum, and Balmain Bug is not a major component of recreational landings. Fishing is unlikely to be having a negative impact on the stock.

On the basis of the evidence provided above, the Western Australian jurisdictional stock is classified as a **negligible stock**.

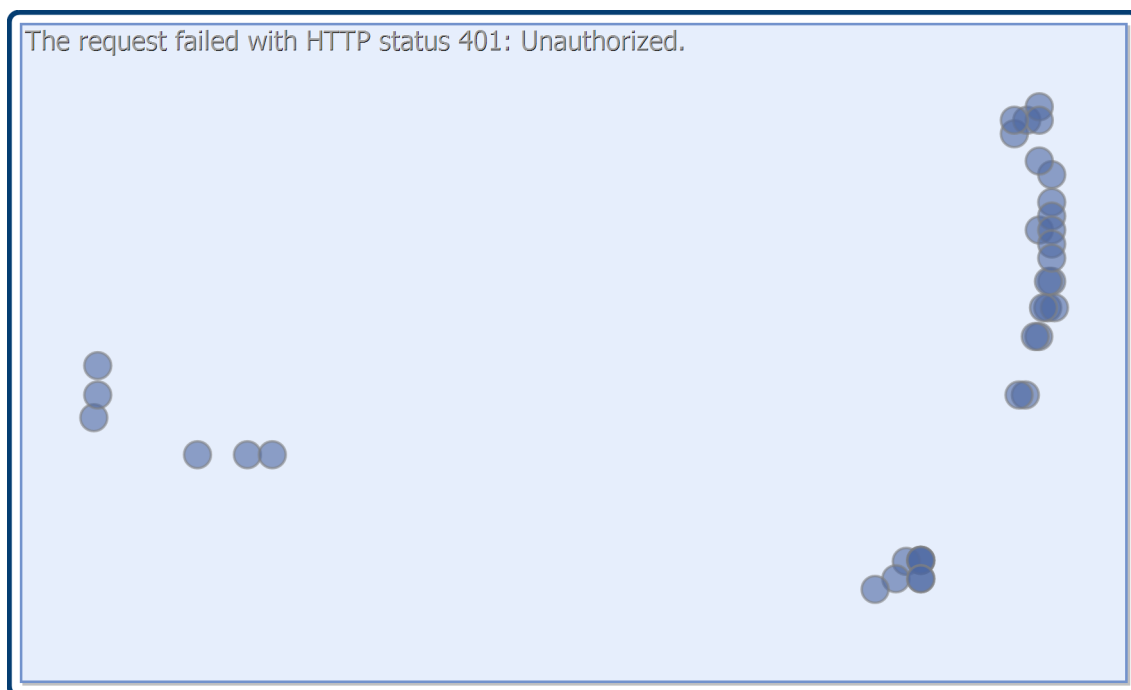
BIOLOGY

Balmain Bugs biology [Stewart et al. 1997; Stewart 1999; Stewart and Kennelly 2000; Haddy et al. 2005; Haddy et al. 2007]

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Species	Longevity / Maximum Size	Maturity (50 per cent)
BALMAIN BUGS	Balmain Bug: 15 years, 86 mm CL Smooth Bug: 5–7 years, 80 mm CL Honey Bug: longevity largely unknown, maximum CL in Queensland samples is 72 mm for females and 66 mm for males. Deepwater Bug: longevity largely unknown, maximum CL in Queensland samples is 55 mm for both females and males. Balmain Bug: 2 years, 50 mm CL Smooth Bug: 2 years, 55 mm CL CL Honey Bug: 47 mm CL Deepwater Bug: 45 mm CL	Balmain Bug: 2 years, 50 mm CL Smooth Bug: 2 years, 55 mm CL Honey Bug: 47 mm CL Deepwater Bug: 45 mm CL

DISTRIBUTION



Distribution of reported commercial catch of BALMAIN BUGS

TABLES

Fishing methods	New South Wales	Queensland	South Australia	Victoria	Western Australia
Commercial					
Net				✓	
Otter Trawl	✓	✓	✓		✓
Various	✓				

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Recreational					
Diving	✓	✓			
Net			✓		

Management Methods				
	New South Wales	Queensland	South Australia	Victoria
Commercial				
Bag limits				✓
By-catch reduction devices		✓		
Effort limits (individual transferable effort)		✓		
Gear restrictions		✓		✓
Harvest Strategy		✓		
Limited entry	✓	✓		✓
Processing restrictions		✓		
Prohibition on take of egg-bearing and tar-spot females		✓		
Retention of females with eggs prohibited			✓	
Seasonal or spatial closures		✓		
Size limit	✓		✓	✓
Size limits		✓		
Spatial closures	✓			✓
Vessel limits		✓		
Vessel restrictions	✓			
Recreational				
Bag limits	✓			✓

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Gear restrictions		✓		✓
Licence	✓			✓
Marine park closures	✓			
Possession limit	✓			
Processing restrictions		✓		
Prohibition on take of egg-bearing and tar-spot females		✓		
Seasonal or spatial closures		✓		
Size limit	✓			
Size limits		✓		
Spatial closures	✓			✓

Catch	New South Wales	Queensland	South Australia	Victoria	Western Australia
Commercial	44.6336 t	30.1772 t	4.2403 t	1.3188 t	0.0539 t
Indigenous	Unknown	Unknown	Unknown	Unknown	
Recreational	Unknown	Unknown	Unknown	Unknown	

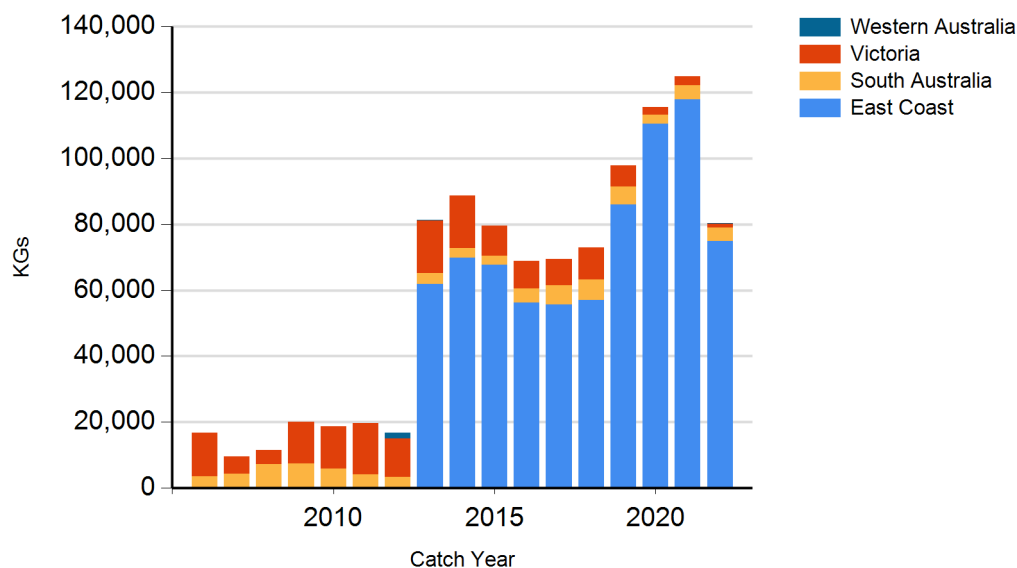
Queensland – Indigenous (management methods) for more information see <https://www.daf.qld.gov.au/business-priorities/fisheries/traditional-fishing>

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

New South Wales – Indigenous (management methods)
<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 BALMAIN BUGS

References

Courtney et al. 2007	Courtney, AJ, Haddy, JA, Campbell, MJ, Roy, DP, Tonks, ML, Gaddes, SW, Chilcott, KE, O'Neill, MF, Brown, IW, McLennan, M, Jebreen, JE, Van Der Geest, C, Rose, C, Kistle, S, Turnbull, CT, Kyne, PM, Bennett, MB and Taylor, J 2007, Bycatch weight, composition and preliminary estimates of the impact of bycatch reduction devices in Queensland’s trawl fishery, Department of Primary Industries and Fisheries. Project No. 2000/170 Report to the Fisheries Research and Development Corporation, May 2007.
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Courtney et al. 2008	Courtney, AJ, Campbell, MJ, Roy, DP, Tonks, ML, Chilcott, KE and Kyne, PM 2008, Round scallops and square-meshes: a comparison of four codend types on the catch rates of target species and bycatch in the Queensland (Australia) Saucer Scallop (<i>Amusium balloti</i>) trawl fishery, <i>Marine and Freshwater Research</i> , (59): 849–864.
Haddy et al. 2005	Haddy, JA, Courtney, AJ and Roy, DP 2005, Aspects of the reproductive biology and growth of Balmain Bugs (<i>Ibacus</i> spp.) (Scyllaridae), <i>Journal of Crustacean Biology</i> , 25(2): 263–273.
Haddy et al. 2007	Haddy, JA, Stewart, J and Graham, KJ 2007, Fishery and biology of commercially exploited Australian fan lobsters (<i>Ibacus</i> spp.), in KL Lavalli and E Spanier (eds), <i>The biology and fisheries of the Slipper Lobster</i> , <i>Crustacean Issues</i> , vol. 17, CRC Press, Boca Raton.
Stewart 2023	Stewart, J 2023, NSW Stock Status Summary 2021/22 – Balmain Bugs – (<i>Ibacus peronii</i> , <i>Ibacus brucei</i> , <i>Ibacus chacei</i> , <i>Ibacus alticrenatus</i>), NSW Department of Primary Industries. Fisheries NSW. 13 pp.
Jacobsen et al. 2015	Jacobsen, I, Zeller, B, Dunning, M, Garland, A, Courtney T and Jebreen, E 2015, An Ecological Risk Assessment of the Southern Queensland East Coast Otter Trawl Fishery and River and Inshore Beam Trawl Fishery, Fisheries Queensland, Department of Agriculture and Fisheries, Brisbane.
Stewart 1999	Stewart, J 1999, Aspects of the biology of Balmain and Smooth Bugs, <i>Ibacus</i> spp. (Decapoda: Scyllaridae) off Eastern Australia, PhD thesis, University of Sydney.
Stewart and Kennelly 2000	Stewart, J and Kennelly, SJ 2000, Growth of the scyllarid lobsters <i>Ibacus peronii</i> and <i>I. chacei</i> , <i>Marine Biology</i> , 136: 921–930.
Stewart et al. 1997	Stewart, J, Kennelly, SJ and Hoegh-Guldberg, O 1997, Size at sexual maturity and the reproductive biology of two species of scyllarid lobster from New South Wales and Victoria, Australia, <i>Crustaceana</i> , 70(3): 344–367.
Smith et al. 2021	Smith, D.C., Haddon, M., Punt, A.E., Gardner, C., Little, L.R., Mayfield, S., O'Neill, M.F., Saunders, T., Stewart, J., Wise, B. and Fulton, E.A. 2021. Evaluating the potential for an increased and sustainable commercial fisheries production across multiple jurisdictions and diverse fisheries. <i>Marine Policy</i> , 124, p.104353.
Wassenberg and Hill 1989	Wassenberg, TJ and Hill, BJ 1989, The effect of trawling and subsequent handling on the survival rates of the by-catch of prawn trawlers in Moreton Bay, Australia, <i>Fisheries Research</i> , 7(1-2), pp.99-110.
Stewart et al. 2022	Stewart, J., Craig, J., Hegarty, A-M., Young, C., Gould, A. and Clain, C. M. 2022. The NSW Commercial Fisheries Port Monitoring Program. Data summary report for 2020/21. NSW Department of Primary Industries - Fisheries: 102 pp.)