

BALMAIN BUGS (2016)

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



John Stewart: Department of Primary Industries, New South Wales, **Brad Zeller:** Department of Agriculture and Fisheries, Queensland, **Stephen Mayfield:** South Australian Research and Development Institute, **James Andrews:** Department of Economic Development, Jobs, Transport and Resources, Victoria, **Mervi Kangas:** Department of Fisheries, Western Australia

STOCK STATUS OVERVIEW

Jurisdiction	Stock	Fisheries	Stock status	Indicators
Western Australia	Western Australia	N/A	Negligible	
Queensland, New South Wales	East Coast	ECOTF, OTF	Sustainable	Catch rates, catch, size structure
Victoria	Victoria	N/A	Negligible	
South Australia	South Australia	N/A	Negligible	

OTF Ocean Trawl Fishery (NSW), ECOTF East Coast Otter Trawl Fishery (QLD), N/A Not Applicable (SA), N/A Not Applicable (VIC), N/A Not Applicable (WA)

STOCK STRUCTURE

The common name ‘Balmain Bug’ refers to four similar species of fan lobster: *Ibacus alticrenatus*, *I. brucei*, *I. chacei* and *I. peronii*[1]. These species partially overlap in their distributions 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 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[1].

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[1]. Stock status of the Balmain Bugs species group in these jurisdictions is therefore presented at the biological stock level—East Coast biological stock.

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 management unit level.

STOCK STATUS

East Coast In New South Wales, Balmain Bugs (primarily true Balmain Bugs and Smooth Bugs) are trawl target species and have been assessed in terms of their commercial nominal catch rates and length compositions in landings. Median catch rates (kg per day in the ocean prawn trawl fishery) have fluctuated throughout the past 20 years but have shown no overall trends[2]. The size compositions in landings have remained stable for both species². The above evidence indicates that the biomass of this part of the stock is unlikely to be recruitment overfished. Landings have declined slowly over the past decade, from an average of 36 tonnes (t) per year in 2006–10 to 28 t per year in 2011–15. Current landings are at historically low levels (19 t in 2015) as a result of a large reduction in fishing effort, with the number of days fished ocean prawn trawling in 2015 being less than 30 per cent of those fished in 2000. This reduction in fishing effort in combination with stable size compositions in landings indicates that fishing mortality is constrained in New South Wales waters to sustainable levels. The above evidence indicates that the current level of fishing pressure is unlikely to cause this part of the stock to become recruitment overfished.

In Queensland, fishers harvest Balmain Bugs as a byproduct of Eastern King Prawn fishing. Logbook data indicates that Balmain bugs contribute only a very minor component of the Eastern King Prawn fishers' catch and landed value. Balmain Bugs fishing mortality is managed by a prohibition on landing of egg-bearing females; conservative minimum legal sizes (MLS), which were updated in 2009; and mandatory use of turtle excluder devices since the early 2000s, which have been shown to lower the incidental catch rates of scyllarid lobsters, including Balmain Bugs[3,4]. In addition, the spawning stock is partly protected from fishing during an annual seasonal closure. Landings have declined over the past decade from an average of 93 t per year in 2006–10 to 79 t per year in 2011–15. While nominal catch rates have declined since 2011 and the 2015 catch was relatively low (66 t), this is considered to be a result of the increased MLS for *I. chacei* and fisher behaviour, and not declining abundance.

A recent risk assessment of the Queensland East Coast Otter Trawl Fishery found a low risk of recruitment overfishing on the Queensland part of the East Coast Balmain Bug stock at the 2009 effort level south of the Great Barrier Reef Marine Park[5,6], where about 83 per cent of the catch is taken. Fishing effort targeting Eastern King Prawn in Queensland has declined by eight per cent since 2009, further reducing the risk of overfishing. The risk of recruitment overfishing within the Great Barrier Reef Marine Park (GBRMP) was assessed to be intermediate to high[7]. However, fishing effort in the GBRMP has declined by 24 per cent since 2009, further reducing risk for this part of the stock.

The above evidence indicates that the biomass of the Queensland part of the stock is unlikely to be recruitment overfished, and the current level of fishing

pressure is unlikely to cause the stock to become recruitment overfished.

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

South Australia Stock status for the South Australian management unit is reported as negligible due to low catches by this jurisdiction. South Australian average catch was 5.2 t per annum in 2006–15.

Victoria Stock status for the Victorian management unit is reported as negligible due to low catches by this jurisdiction. Victorian catch ranged from 10–16 t per annum in 2011–15.

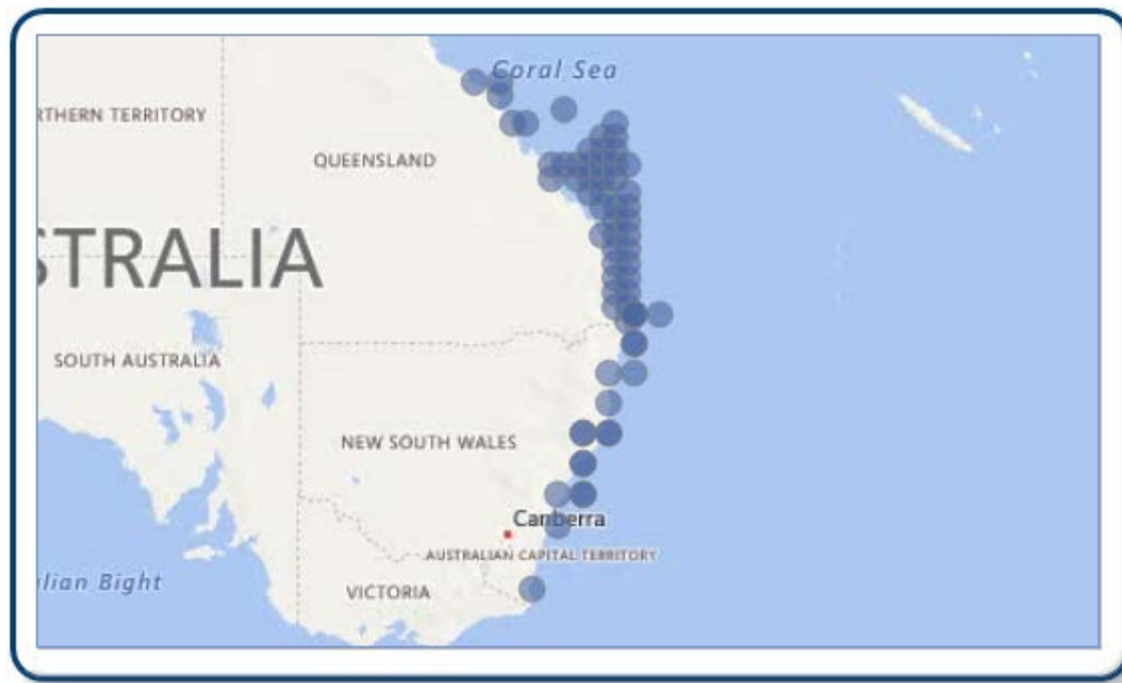
Western Australia Stock status for the Western Australian management unit is reported as negligible due to low catches by this jurisdiction. Western Australian catch was less than 300 kg per annum in 2004–15.

BIOLOGY

Balmain Bugs biology^{1,8–13}

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

DISTRIBUTION



Distribution of reported commercial catch of Balmain Bugs

TABLES

Commercial Catch Methods	New South Wales	Queensland	South Australia	Victoria	Western Australia
Otter Trawl	✓	✓			
Unspecified			✓	✓	✓

Fishing methods	New South Wales	Queensland	South Australia	Victoria	Western Australia
Commercial					
Otter Trawl	✓	✓			
Unspecified			✓	✓	✓
Indigenous					
Diving	✓				
Recreational					
Diving	✓				

Management Methods	New South Wales	Queensland
Commercial		
Limited entry	✓	✓
Size limit	✓	✓
Spatial closures	✓	

Vessel restrictions	✓	✓
Indigenous		
Bag limits	✓	
Section 31 (1)(c1), Aboriginal cultural fishing authority	✓	
Size limit	✓	
Spatial closures	✓	
Recreational		
Bag limits	✓	
Size limit	✓	
Spatial closures	✓	
Active Vessels		
	New South Wales	Queensland
	88 Vessel in OTF,	154 License in ECOTF,

ECOTF East Coast Otter Trawl Fishery(QLD)

OTF Ocean Trawl Fishery(NSW)

Catch	New South Wales	Queensland	South Australia	Victoria	Western Australia
Commercial	19.3051t in OTF,	66.1745t in ECOTF,			

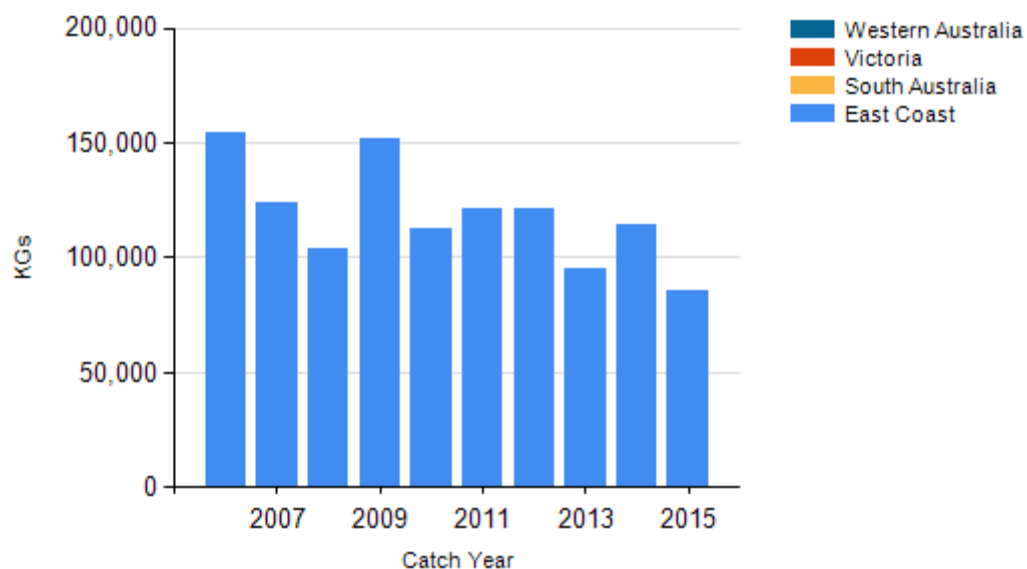
OTF Ocean Trawl Fishery (NSW), ECOTF East Coast Otter Trawl Fishery (QLD), N/A Not Applicable (SA), N/A Not Applicable (VIC), N/A Not Applicable (WA),

a Queensland – Indigenous (management methods) In Queensland, under the Fisheries Act 1994, Indigenous fishers can use prescribed traditional and non-commercial fishing apparatus in waters open to fishing. Size and possession limits and seasonal closures do not apply to Indigenous fishers. Further exemptions to fishery regulations can be obtained through permits.

b New South Wales – Indigenous (management methods) Aboriginal Cultural Fishing Interim Access Arrangement—allows an Indigenous fisher in New South Wales to take in excess of a recreational bag limit in certain circumstances; for example, if they are doing so to provide fish to other community members who cannot harvest for themselves.

c New South Wales – Indigenous (management methods) Aboriginal cultural fishing authority—the authority that Indigenous persons can apply to take catches outside the recreational limits under the NSW Fisheries Management Act 1994 (NSW), Section 37 (1)(c1), Aboriginal cultural fishing authority.

CATCH CHART



Commercial catch of Balmain Bugs - note confidential catch not shown

EFFECTS OF FISHING ON THE MARINE ENVIRONMENT

- The East Coast Otter Trawl Fishery (Queensland) interacts with a number of protected species, including turtles and sea snakes[14,15]. Turtle excluder devices and bycatch reduction devices are deployed by all boats to reduce the amount of bycatch[16]. Fisher compliance with legislated design principles and best practice use of these devices is mandatory to ensure they function effectively to limit capture of turtles and sea snakes. Interactions with these species are monitored through 'Species of Conservation Interest' logbooks[17].

ENVIRONMENTAL EFFECTS on BALMAIN BUGS

- The major environmental factor influencing the Balmain Bug biological stock is likely to be the southerly flow of the East Australian Current. The impact of changes in the East Australian Current on recruitment of these species is currently unknown[1,10].

References	
1	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), The biology and fisheries of the Slipper Lobster, <i>Crustacean Issues</i> , vol. 17, CRC Press, Boca Raton.
2	Stewart, J, Hegarty, A, Young, C, Fowler, AM and Craig, J 2015, <i>Status of Fisheries Resources in NSW 2013-14</i> , NSW Department of Primary Industries, Mosman: 391pp.
3	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, <i>Bycatch weight, composition and preliminary estimates of the impact of bycatch reduction devices in Queensland's trawl fishery</i> , Department of Primary Industries and Fisheries. Project No. 2000/170 Report to the Fisheries Research and Development Corporation, May 2007.
4	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.
5	Astles, KL, Holloway, MG, Steffe, A, Green, M, Ganassin, C, Gibbs, PJ 2006, An ecological method for qualitative risk assessment and its use in the management of fisheries in New South Wales, Australia, <i>Fisheries Research</i> 82: 290-303.
6	Department of Agriculture and Fisheries 2016, in review, <i>An Ecological Risk Assessment of the Southern Queensland East Coast Otter Trawl Fishery and the River and Inshore Beam</i>

STATUS OF AUSTRALIAN FISH STOCKS REPORT
BALMAIN BUGS (2016)

	<i>Trawl Fishery.</i>
7	Pears, RJ, Morison, AK, Jebreen, EJ, Dunning, M, Pitcher, CR, Courtney, AJ, Houlden, B and Jacobsen, IP 2012, <i>Ecological Risk Assessment of the East Coast Otter Trawl Fishery in the Great Barrier Reef Marine Park: Summary Report</i> , Great Barrier Reef Marine Park Authority, Townsville.
8	Haddy, JA, Courtney, AJ and Roy, DP 2005, Aspects of the reproductive biology and growth of Balmain Bugs (<i>Ibacus spp.</i>) (Scyllaridae), <i>Journal of Crustacean Biology</i> , 25(2): 263–273.
9	Roberts, SD and Steer, MA 2010, <i>By-product assessment in the Spencer Gulf Prawn Fishery with an emphasis on developing management options for Balmain Bugs</i> , South Australian Research and Development Institute (Aquatic Sciences), SARDI publication F2010/000165-1, SARDI Research Report Series no. 439, SARDI, Adelaide.
10	Stewart, J 1999, <i>Aspects of the biology of Balmain and Smooth Bugs, Ibacus spp., (Decapoda: Scyllaridae) off Eastern Australia</i> , PhD thesis, University of Sydney.
11	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.
12	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.
13	Stewart, J and Kennelly, SJ 1998, Contrasting movements of two exploited scyllarid lobsters of the genus <i>Ibacus</i> off the east coast of Australia, <i>Fisheries Research</i> , 36: 127–132.
14	Robins, JB 1995, Estimated catch and mortality of sea turtles from the East Coast Otter Trawl Fishery of Queensland, Australia, <i>Biological Conservation</i> 74: 157–167.
15	Courtney, AJ, Schemel, BLK, Wallace, R, Campbell, MJ, Mayer, DG and Young, B 2010, <i>Reducing the impact of Queensland's trawl fisheries on protected sea snakes</i> , Queensland Government and the Fisheries Research Development Corporation.
16	Queensland Government 2016, <i>Commercial trawl fisheries</i> , Business and industry portal, Queensland Government.
17	Queensland Government 2016, <i>Commercial fishing logbooks</i> , Business and industry portal, Queensland Government.