Eastern Rock Lobster (2020)

Sagmariasus verreauxi

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STOCK STATUS OVERVIEW

Jurisdiction	Stock	Stock status	Indicators
New South Wales	New South Wales Rock Lobster Fishery	Sustainable	Biomass, CPUE, catch as percentage of TACC, spawning stock abundance (FIS-based), puerulus recruitment (FIS-based), size structure

STOCK STRUCTURE

Eastern Rock Lobsters occur on rocky reef and sand/mud substrates in depths of less than 1 m to around 200 m, from southern Queensland to Port MacDonnell in South Australia, including around Tasmania [Montgomery and Liggins 2013]. The greatest abundances and the only significant catches occur along the New South Wales coast, where Eastern Rock Lobster is taken by commercial and recreational fishers [NSW DPI 2007, Montgomery and Liggins 2013, Liggins et al. 2020]. This species also occurs off New Zealand, predominantly around the North Island [Kensler 1967, Booth 2011].

The spawning stock of Eastern Rock Lobster in Australia is concentrated on the north coast of New South Wales. Following spawning and a nine-month larval phase (pelagic phyllosoma larvae), puerulus post-larvae recruit to shallow inshore reefs along the entire New South Wales coast [Montgomery and Craig 2005, Liggins et al. 2020]. This suggests a single New South Wales (Australian) biological stock. Genetic studies done in the 1990s suggested that the stocks off Australia and New Zealand may be discrete populations [Brasher et al. 1992, Ovenden and Brasher 1994]. However, contemporary techniques using single nucleotide polymorphisms to genotype Eastern Rock Lobsters from New South Wales, Tasmania and New Zealand found genetic homogeneity across the three regions [Woodings et al. 2018]. This finding is consistent with oceanographic modelling that demonstrated the potential for a small proportion of phyllosoma larvae to be transported eastward across the Tasman Sea to New Zealand [Chiswell et al. 2003]. This implies that recruitment to the New South Wales (Australian) stock is dependent on the New South Wales spawning stock but that recruitment to the New Zealand stock is likely supplied by spawning stocks in both New Zealand and New South Wales.

Here, assessment of stock status is presented at the biological stock level—New South Wales Rock Lobster Fishery.

STOCK STATUS

New South Wales Rock Lobster Fishery

Following concerns about the sustainability of the Eastern Rock Lobster resource in the early-1990s, stock abundance has responded positively to management initiatives, including the introduction of a maximum legal length, individually numbered management tags, share management and a total allowable commercial catch (TACC) [NSW DPI 2000, NSW DPI 2007, Montgomery and Liggins 2013, Liggins et al. 2020, NSW Gov. 2020]].

The annual TACC has effectively been taken (that is, more than 95 per cent caught) each year since 2004–05, indicating that the TACC has been limiting catch. Catch during the most recent complete quota year (August 2018–July 2019) was 169.4 tonnes (t), marginally below the 2018–19 TACC of 170 t. The TACC has increased from 102 t in 2004–05 to 170 t in 2019–20. and has been increased by an additional 10 t to 180 t for the 2020–21 season [NSW Gov. 2020]. Small shortfalls on the annual TACC have occurred due to limitations of the quota trading system in coping with the seasonality of different spatial components of the fishery. Between 2014–15 and 2018–19, between four and ten t of legal-size lobsters have been discarded annually due to individual fishers in the deep-water component of the fishery catching more than their quota. Catch per unit effort has increased approximately four-fold since a low point in the early 1990s and is currently the greatest observed during the past four decades. Abundance of spawning stock, estimated from a fishery-independent trap-based survey, increased approximately four-fold between the late 1990s—early 2000s and the most recent survey during 2018–19. Based on an annual survey of puerulus abundance along the New South Wales coast, recruitment of pueruli has shown inter-annual fluctuations but also an increasing trend during the past two decades, approximately doubling since the mid-1990s [Liggins et al. 2020].

A length-structured model of the lobster population and the fishery provides annual estimates of stock biomass and depletion of biomass relative to pre-exploitation levels, and a prospective risk analysis of the likely consequence for biomass of alternative future TACCs. The base-case scenario of the most recent assessment [Liggins et al. 2020] estimated that spawning biomass (SB) at the commencement of the 2019–20 season was 35 per cent (90 per cent confidence interval 30–46 per cent) of the unfished (1884–85) level, having increased eight-fold (median SB2019–20/SB1994–95 = 7.9; 90 per cent confidence interval 6.5–9.6) since 1994–95. Multiple sensitivity scenarios, in which key assumptions in the base-case scenario were examined, all provided estimates of current SB depletion (2019–20) that were above the proposed limit reference point of 20 per cent [Liggins et al. 2020]. The stock is not considered to be recruitment impaired.

Based on the prospective risk analysis of the consequences of alternative future catches, an independent Total Allowable Fishing committee sets TACCs annually to maintain the spawning biomass above the limit reference point.. Moreover, although there is no formal target reference point for the stock, the stock has now rebuilt to a level approaching the range of biomass where common fishery targets are expected to be for this species [NSW Gov. 2020]. Prospective, model-based, risk assessment of alternative TACCs suggests that the current TACC will maintain the stock close to a proposed target reference point of 1.2*Bmsy (a common proxy for Bmey) [Liggins et al. 2020, NSW Gov. 2020]. This level of fishing mortality is unlikely to cause the stock to become recruitment impaired.

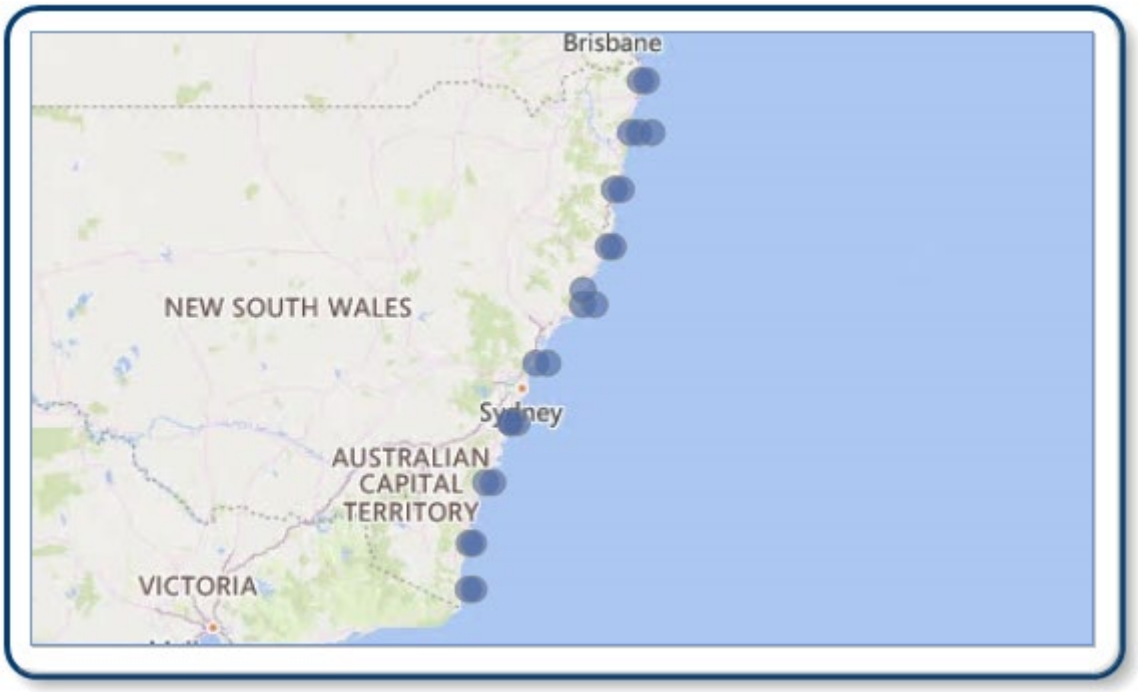
On the basis of the evidence provided above, the biological stock is classified as a **sustainable stock**.

BIOLOGY

Eastern Rock Lobster biology [Montgomery 1992, Montgomery et al. 2009, Montgomery and Liggins 2013]

Species	Longevity / Maximum Size	Maturity (50 per cent)
Eastern Rock Lobster	≥ 30 years, 260 mm CL	Females 167 mm CL

DISTRIBUTION



Distribution of reported commercial catch of Eastern Rock Lobster

TABLES

Fishing methods	
	New South Wales
Commercial	
Diving	✓
Rock Lobster And Crayfish Traps And Pots	✓
Various	✓
Recreational	
Diving	✓
Rock Lobster And Crayfish Traps And Pots	✓

Management Methods	
	New South Wales
Commercial	
Demerit points, share confiscation	✓
Gear restrictions	✓
Individual transferable quota	✓
Limited entry	✓
Management tags	✓
Marine park closures	✓
Mesh size regulations	✓
Protection of egg-bearing females	✓
Size limits	✓
Spatial closures	✓
Total allowable catch	✓
Vessel restrictions	✓
Recreational	
Bag and possession limits	✓
Bag limits	✓
Gear restrictions	✓
Licence	✓
Marine park closures	✓
Protection of egg-bearing females	✓
Size limits	✓
Spatial closures	✓

Catch	

	New South Wales
Commercial	168.928 t
Indigenous	Unknown
Recreational	16 t (2013-14)

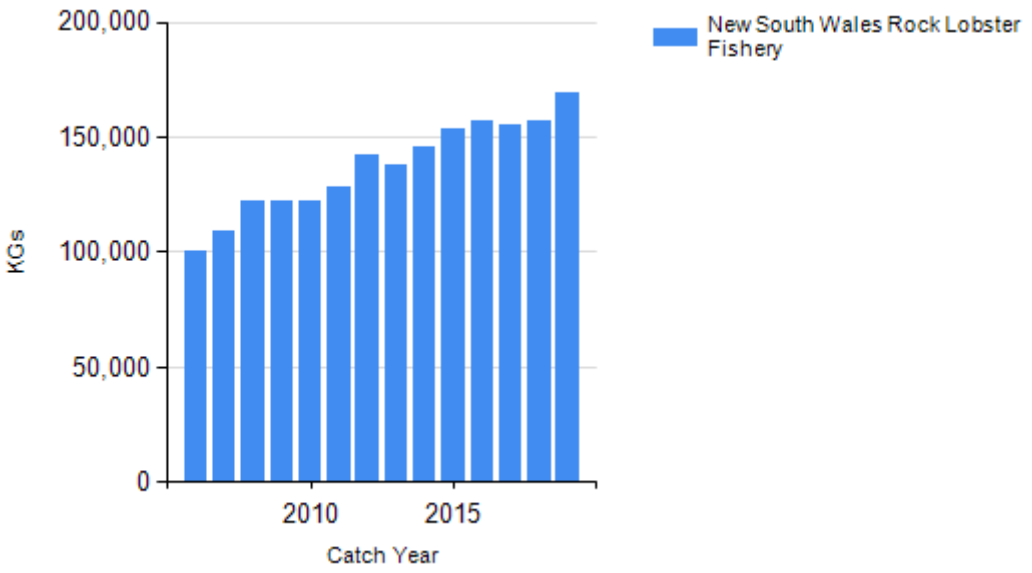
New South Wales – Commercial (Fishing Methods / Diving). Diving method is skindiving only, use of underwater breathing apparatus is not permitted.

New South Wales – Recreational (Catch totals). Recreational catch of 16 t is based on (i) an estimate of 23 216 (standard error ± 12 501) lobsters taken by recreational fishers during 2013–14 [West et al 2015]; and (ii) an assumed mean weight of 689 g per lobster (mean weight caught by commercial fishers in depths less than 10 m during 2013–14). This remains the most reliable estimate of annual recreational catch because the 2017–18 survey estimate of 4.6 t [Murphy et al. 2020] applies only to 1–3 year recreational licence holders.

New South Wales – Recreational (Fishing Methods) Diving method is skindiving only, use of underwater breathing apparatus is not permitted.

New South Wales – Indigenous (Management Methods) Customary Fishing Management Arrangements. See https://www.dpi.nsw.gov.au/fishing/aboriginal-fishing

CATCH CHART



Commercial catch of Eastern Rock Lobster - note confidential catch not shown

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