# Eastern Rock Lobster (2023)

*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. 2023]. 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 (as 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. 2023]. 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. 2023; NSW TAFC 2023]. A formal harvest strategy for the fishery was recently implemented [NSW DPI 2022] and the fishery gained Marine Stewardship Council certification in 2023 [MSC 2023].

The annual TACC has effectively been taken (that is, more than 95% caught) each year since 2004–05, indicating that the TACC has been limiting catch. Catch during the quota year (August 2021–July 2022) was 179.6 tonnes (t), marginally below the 2021–22 TACC of 180 t. The TACC has increased from 102 t in 2004–05 to 180 t in 2021–22, was increased to 200 t for the 2022–23 season and held at this level for the 2023–24 season [NSW TAFC 2023]. 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 2021–22, between 4 and 44 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. Annual discards of legal-size lobsters were typically between 4 and 10 t but with 44 t in 2019–20 and 19 t discarded in 2020–21. 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. The abundance of spawning stock, estimated from a fishery-independent trap-based survey, increased approximately six-fold between the late 1990s/early 2000s and the most recent survey during 2022–23. 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. 2023].

A length-structured model of the lobster population and the fishery provides annual estimates of stock biomass, depletion of biomass relative to pre-exploitation levels and limit and target reference points prescribed in the Harvest Strategy for the fishery [NSW DPI 2022]. The Total Allowable Fishing Committee's determination of a 200 t TACC for 2023-24 was, for the first time, based on the application of harvest strategy decision rules within the stock assessment [Liggins et al. 2023; NSW TAFC 2023]. Estimated spawning biomass (SB) at the commencement of the 2022–23 season was 32.5% (90% confidence interval 26–45%) of the unfished (1884–85) level, having increased ten-fold (median SB2022–23/SB1994–95 = 10.8; 90% confidence interval 8.1–16.4) since 1994–95. Multiple sensitivity scenarios, in which key assumptions in the base-case scenario were examined, all provided estimates of current SB depletion (2022–23) that were above the limit reference point of 20% [Liggins et al. 2023]. The stock is not considered to be recruitment impaired.

The estimated depletion of SB at the commencement of 2023–24, assuming the 2022–23 TACC was fully caught, of 32.9% was marginally greater than the target reference point prescribed in the harvest strategy and the TACC of 200 t for 2023–24 was based on the exploitation rate associated with Optimum

Sustainable Yield (OSY) such that biomass is maintained around target levels (BOSY = 1.2*BMSY). This level of fishing mortality is unlikely to cause the stock to become recruitment impaired.

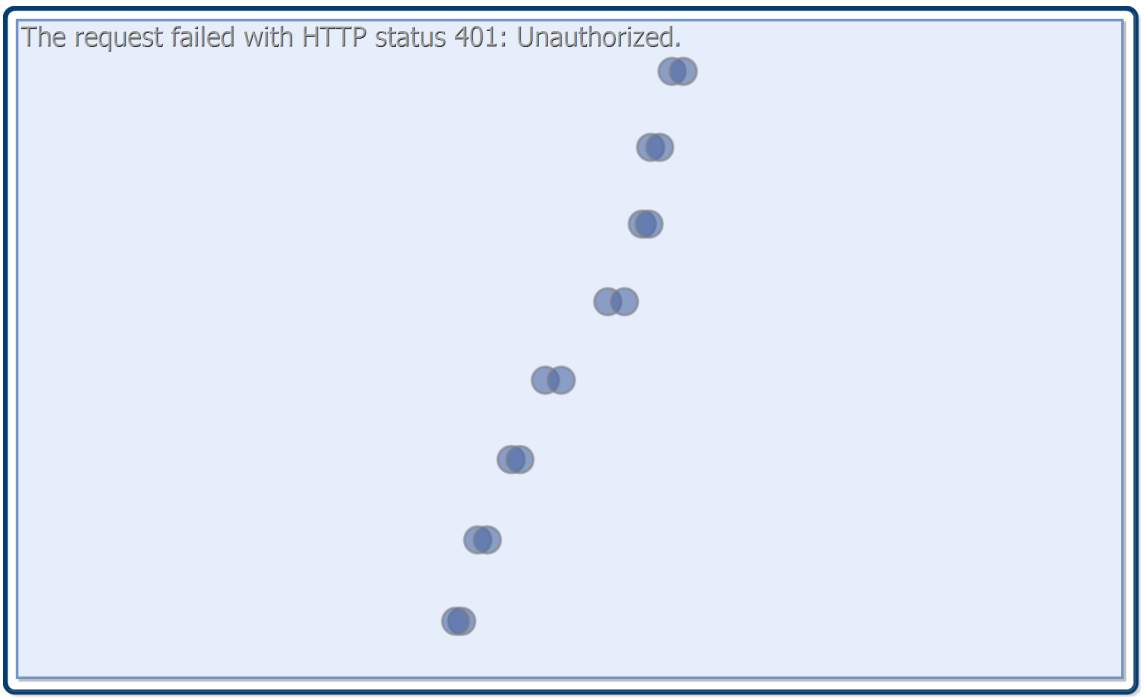
On the basis of the evidence provided above, the biological stock is classified as a **sustainable stock**.

## 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 | At least 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 | ✓ |
| **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** | 179.689 t |
| **Indigenous** | Unknown |
| **Recreational** | 9 t |

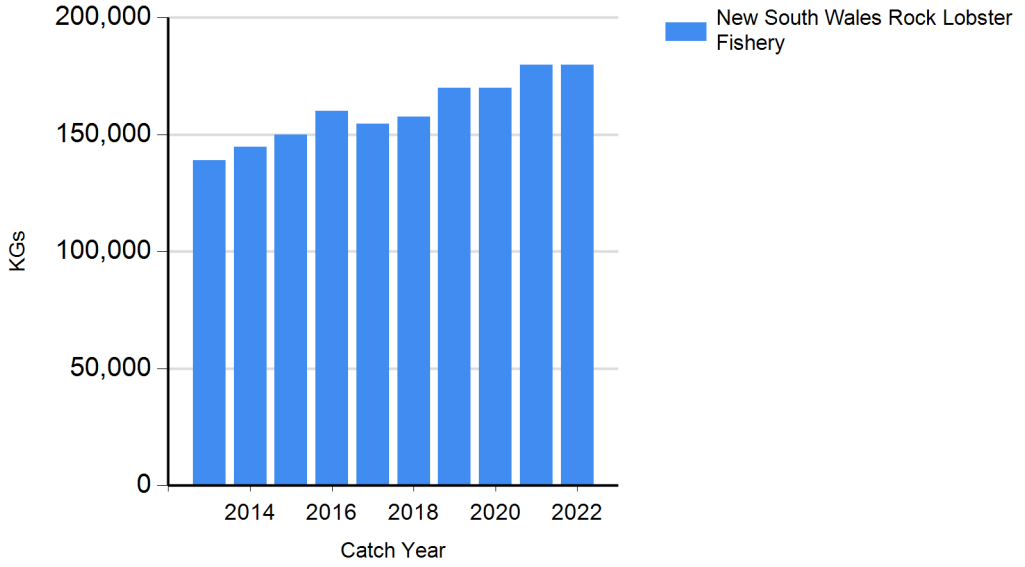
**New South Wales – Commercial (Fishing Methods / Diving).** Diving method is skindiving only, use of underwater breathing apparatus is not permitted.

**New South Wales – Recreational (Catch totals).** Recreational catch of 9 t per annum is based on (i) the estimated mean number of lobsters taken in 4 surveys of recreational catch between 2000–01 and 2019–20; and (ii) an assumed mean weight of 682 g per lobster (based on the mean weight caught by commercial fishers in depths less than 10 m during the 2013–14 and 2019–20 surveys of recreational catch). This represents a reasonable estimate of recreational catch per annum during the last 2 decades due to the imprecision of the estimates from the 4 surveys of recreational catch - eg. 8,662 (se 6,697) lobsters from the 2019–20 survey [Murphy et al. 2022; Liggins et al. 2023].

**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).** Cultural Fishing Management Arrangements. See https://www.dpi.nsw.gov.au/fishing/aboriginal-fishing

**CATCH CHART**




Commercial catch of Eastern Rock Lobster - Years represent fishing periods (1 August - 31 July) for which annual TACCs are set - eg. '2022' represents 1 August 2021–31 July 2022.

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