Eastern Rock Lobster

Sagmariasus verreauxi

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STOCK STATUS OVERVIEW

Stock status determination

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

NSWRLF New South Wales Lobster Fishery (NSW)

STOCK STRUCTURE

Eastern Rock Lobster (*Sagmariasus verreauxi*) [1] occurs 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. 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 [2,3]. The species also occurs off New Zealand, predominantly around the North Island [1,4].

The spawning stock of Eastern Rock Lobster in Australia is restricted to 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. This suggests a single New South Wales (Australian) biological stock. Genetic studies have provided

preliminary evidence that the stocks off Australia and New Zealand may be discrete populations [5,6]. A current project, using contemporary genetic techniques, is re-examining the connectivity between Australian and New Zealand populations; and among New South Wales, Victorian and Tasmanian components of the Australian population of Eastern Rock Lobster.

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) [2,3,7–9].

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. TACC has increased from 102 tonnes (t) in 2004–05 to 160 t in 2015–16. Catch during the most recent complete quota year (August 2014–July 2015) was 149.8 t, marginally below the 2014–15 TACC of 150 t. 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 2014–15. Based on an annual survey of puerulus abundance along the New South Wales coast, recruitment of pueruli has shown interannual fluctuations but also an increasing linear trend during the past two decades, approximately doubling since the mid-1990s [2].

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 [2] estimated that spawning biomass (SB) at the commencement of the 2014–15 season was 34 per cent (90 per cent confidence interval = 24–46 per cent) of the unfished (1884–85) level, having increased four-fold (median SB2014–15/SB1994–95 = 4.18; 90 per cent confidence interval = 3.30–5.22) since 1994–95. An alternative scenario of the model, in which recent recruitment was increased to better represent observed recruitment to the fishery, provided greater estimates of current spawning biomass. The stock is not considered to be recruitment overfished.

Based on the prospective risk analysis of the consequences of alternative future catches, an independent Total Allowable Catch Committee [9] sets TACCs annually to maintain the spawning

biomass above the biological reference point of 25 per cent of unfished biomass. 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 New South Wales Rock Lobster Fishery biological stock is classified as a **sustainable stock**.

BIOLOGY

Eastern Rock Lobster biology [3,10,11]

Biology

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

DISTRIBUTIONS

Distribution of reported commercial catch of Eastern Rock Lobster

TABLES

Fishing methods

	New South Wales
Commercial	
Rock Lobster And Crayfish Traps And Pots	✔
Indigenous	
Diving	✔
Rock Lobster And Crayfish Traps And Pots	✔
Recreational	
Diving	✔
Rock Lobster And Crayfish Traps And Pots	✔

Management methods

Method	New South Wales
Commercial	
Demerit points, share confiscation	✔
Gear restrictions	✔
Limited entry	✔
Management tags	✔
Size limit	✔
Spatial closures	✔
Total allowable catch	✔
Vessel restrictions	✔
Indigenous	
Aboriginal cultural fishing authority	✔
Bag limits	✔
Gear restrictions	✔
Size limit	✔
Spatial closures	✔
Recreational	
Bag limits	✔
Gear restrictions	✔
Size limit	✔

Method	New South Wales
Spatial closures	✔

Active vessels

	New South Wales
	77 in NSWRLF

NSWRLF New South Wales Lobster Fishery (NSW)

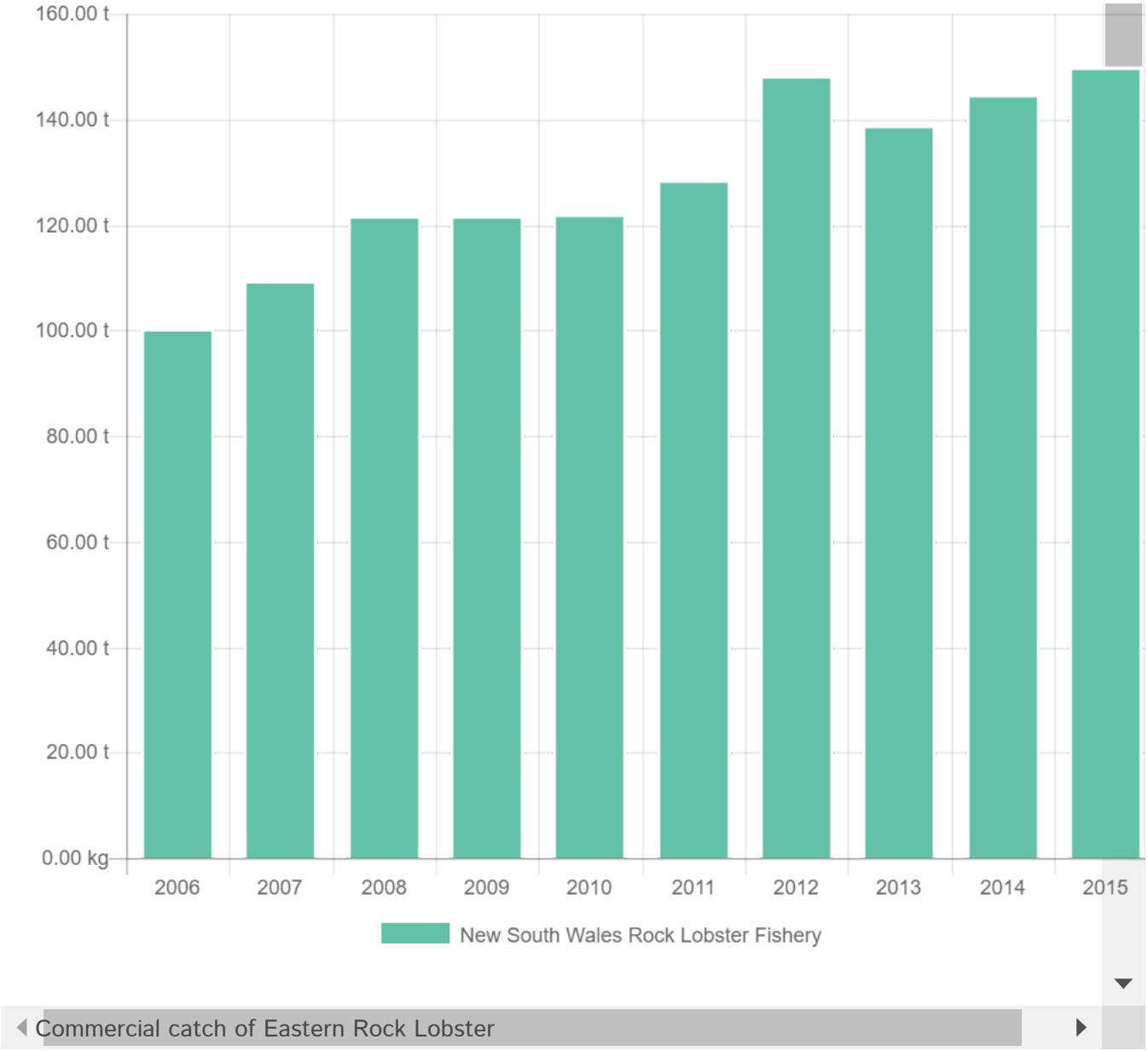
Catch

	New South Wales
Commercial	149.82t in NSWRLF
Recreational	16 t (2013–14), Unknown

NSWRLF New South Wales Lobster Fishery (NSW)

a New South Wales – Indigenous (management method) The 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 themselves.
b New South Wales – Indigenous (management method) The Aboriginal cultural fishing authority is the authority that Indigenous persons can apply to take catches outside the recreational limits under the Fisheries Management Act 1994 (NSW), Section 37 (1)(c1), Aboriginal cultural fishing authority.
c New South Wales – Active vessels Seventy-seven fishing businesses reported catches during the 2014–15 fishing season.
d New South Wales – Recreational (catch) Recreational catch of 16 t is based on (i) an estimate of 23 216 (standard error±12 501) lobsters taken by recreational fishers during 2013–1412 and (ii) an assumed mean weight of 689 g per lobster (mean weight caught by commercial fishers in depths less than10 m during 2013–14).

CATCH CHART



EFFECTS OF FISHING ON THE MARINE ENVIRONMENT

- Bycatch from the commercial fishery is minimal (based on data from observer surveys), and fishing with traps is likely to result in minimal physical disturbance to benthic habitats relative to the impacts of sea and swell in a high-energy coastal environment.
- Loss of traps in the deepwater component of the fishery, associated with loss of headgear, results in some ghost-fishing mortality of Rock Lobsters. This unproductive mortality is the subject of current research, and is being mitigated through the adoption of sacrificial panels in traps and acoustic release technology to provide 'at call' access to submerged headgear [13].
- Entanglement of whales and other cetaceans in line or rope is documented for waters off the New South Wales coast in a database maintained by the New South Wales National Parks and Wildlife Service [14]. However, no such entanglements have been directly attributed to the lobster fishery. Moreover, the risk of whales becoming entangled in the head-gear (ropes and floats) of Lobster traps on the mid- and outer-continental shelf off New South

Wales has been significantly reduced during the past two decades due to the practice of submerging head-gear deep within the water column using galvanic time releases and acoustic releases. This practice effectively limits the length of rope and the time that rope is exposed in the water column, thereby minimising the likelihood of encounter and entanglement of whales.

- Physical impacts of fish and prawn trawling on benthic habitat inhabited by lobsters (in particular, low relief reefs on the mid-continental shelf) may have negative effects on the lobster population and subsequent catches at affected locations.

ENVIRONMENTAL EFFECTS ON EASTERN ROCK LOBSTER

- The East Australia Current is the dominant oceanographic feature off south eastern Australia. Increases in water temperature and the movement of anti-cyclonic eddies further southward have been observed over the past 60 years and these trends are projected to continue into the future [15,16]. Such projections potentially affect the distribution of spawning stock, larval dispersal, and the strength and distribution of recruitment of peuruli. This would influence the distribution and abundance of juvenile Lobsters recruiting to the fishable stock, and subsequently spatial and temporal patterns of catch in the fishery.

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