

NSW TOTAL ALLOWABLE FISHING COMMITTEE

EASTERN ROCK LOBSTER FISHERY

DETERMINATION FOR THE 2021/22 FISHING PERIOD

24 May 2021

Executive Summary

Preamble

The New South Wales (NSW) Total Allowable Fishing Committee (T AFC) has statutory responsibilities set out in Part 2A of the *Fisheries Management Act 1994* (the Act) to determine the Total Allowable Commercial Catch (TACC) or Total Allowable Commercial Effort (TACE) by NSW fishers holding the relevant endorsement in some commercial fisheries. Various fishing regulations under the Act also contain provisions requiring the making of fishery determinations.

The T AFC is an independent statutory body established under Schedule 2 of the Act. In making a determination on catch or effort in a commercial fishery, the T AFC must consider the ecological, economic and social issues associated with each fishery and make determinations that 'on balance' pursue the objectives of the Act.

The T AFC is not subject to the control or direction of the Minister as to any determination made. However, the Minister may direct the T AFC on the procedures to be followed and the matters to be taken into account in making a fishing determination.

This determination is for Eastern Rock Lobster for the period 1 August 2021 to 31 July 2022.

Management recommendations & supporting actions

The T AFC provides the following recommendations to the Minister, NSW Fisheries and the fishing industry towards improving the management of the fishery:

1. The data from the fishery independent survey (FIS) are valuable and every effort should be made to use all the data collected in the stock assessment model. We recommend an investigation of using FIS length frequency data more comprehensively by fitting the model to it.
2. The developing harvest strategy should consider the relationship between the current estimate of B_{MSY} and B_{20} when developing a target reference point.
3. The Department explore options for refining precision and accuracy of recreational catch estimates.

Determination

The Total Allowable Fishing Committee, pursuant to Part 2A of the *Fisheries Management Act 1994*, determines that the commercial catch of Eastern Rock Lobster should be controlled and allocated through the following measure:

- A TACC of **180 tonnes** during the fishing period 1 August 2021 to 31 July 2022.

Introduction

The Eastern Rock Lobster (ERL) Fishery operates across all waters managed by NSW with the exception of those areas closed to fishing. Management of the fishery uses a range of input and output controls, including a total allowable commercial catch (TACC) with individual transferable quotas (ITQs); a maximum (180 mm) and minimum (104 mm) size limit; prohibition on the taking of berried females and fishing gear restrictions (traps). Tags must be fitted to each lobster landed in the commercial fishery, immediately after landing or prior to transferring lobster into a pen, to another boat or consigning to a market.

Although considered a single species fishery, there is a reasonable level of retained by-catch in the fishery, with the top four species being Ocean jacket, Grey Morwong, Hermit crab and Snapper.

Shareholders in the ERL Fishery are eligible for an endorsement if holding a minimum of 55 shares in the fishery (if a new entrant) and may take the lobster themselves or nominate another licensed commercial fisher to operate their fishing business. Shares were first allocated for this fishery in 2000 and were automatically renewed for a further 10-year period in 2010 and 2020. The maximum shareholding in the fishery is 350 shares. The total number of shares in the fishery is 9,621. In 2019-20, there were 101 lobster fishery shareholders with 74 authorised fishers.

The ERL Fishery is considered sustainable. There is no formal harvest strategy for the fishery, although a draft strategy is under active development. Gross value of production for 2019-20 was estimated at approximately \$13 million.

The TAFC met with a number of shareholders in the ERL Fishery in Sydney on 5 May 2021 to discuss fishery biology, catch and associated management issues. Written submissions by shareholders on the stock status for the fishery and other fishery management issues were provided to the Committee by the NSW Department of Primary Industries. A current stock assessment report on the fishery was also provided to the Committee by the Department¹.

Biological considerations

Eastern Rock Lobster (ERL) range from the Queensland to Victorian borders. They can live for more than 30 years and grow up to 260 mm carapace length (CL). They mature at around 167 mm CL. Minimum legal size of ERL is 104 mm CL and the stock is managed with an upper maximum legal size of 180 mm CL. Small lobsters are found in inshore waters <10m depth. Medium size lobsters occur across the continental shelf in depths up to 200m. Spawning stock and lobsters greater than the maximum legal length (oversize) are concentrated on the north coast of NSW in

¹ G.W. Liggins, M.E. Miller & G. Ballinger (2021) RESOURCE ASSESSMENT: Eastern Rock Lobster (*Sagmariasus verreauxi*). NSW Department of Primary Industries.

depths 10 – 120 metres. Larvae progress through a pelagic phase to a post-larval stage (pueruli) which then settle on nearshore rocky reefs throughout NSW waters.

The stock assessment of ERL is based on a range of data including:

1. fishery dependent catch per unit of effort (CPUE) data collected from fisher logbooks;
2. fishery dependent recruitment index based on the catch rate of sub-legal length lobsters;
3. a fishery independent survey (FIS) conducted every two years of the abundance and size-distribution of spawning and oversize lobsters in 10-30m depths on the north coast of NSW; and
4. an index of recruitment from a fishery independent puerulus survey, conducted annually.

The assessment model depends on the total number of lobsters that have been removed from the population historically. While reported catch from commercial fishing is reliable, non-commercial catches and unreported commercial catches represent an uncertainty in the assessment. Assumptions that the latter, during the past decade, represents about 9.3% of the total commercial catch and the former 10.9%, means that total removals were assumed to be around 20% higher than the reported commercial catch. The assessment report documents sensitivities to these assumptions. These assumptions also have implications in setting a TACC based on total catch.

The results of the stock assessment also assume that in addition to total removals 10% of discarded fish do not survive.

Catches have steadily risen since early 2000's, effort declined and CPUE consequently increased. We noted that the CPUE last year (2019-20) increased substantially over the previous year. New data for 2020-21 will indicate whether this is a statistical or real effect. Preliminary CPUE for the 2020-21 season indicates that CPUE and thus stock biomass, continues to increase.

Puerulus settlement shows a long-term increasing trend since 1995-96. The Tuncurry and southern stations show positive variations above this trend. However, the Committee notes that major flooding in March 2021, particularly on the north coast of NSW, could reduce the chance of this cohort surviving and subsequently recruiting to the fishery.

The cohort of sub-legal lobsters that will enter the fishery in the coming years has high abundance. The CPUE of sub-legal lobster in inshore waters this year of 1.36/ lift predicts 0.81/ lift in those waters next year. The FIS data indicate that stock abundance continues to increase. The FIS also shows that the cohort associated with a possible recruitment event around 2012-13 has made its way through the fishery. The data this year also indicate another peak in 150 mm lobsters, which may indicate a strong recruitment into the spawning stock next year.

A length-based stock assessment model was used to estimate the stock size using an empirically-based length-class transition matrix incorporating growth curves and

tagging data. The model has changed from previous years. Natural mortality (M) is now estimated, somatic growth rate (k) has been revised down and the non-linear relationship between CPUE and biomass has been removed. The model was fit to commercial CPUE and length frequencies and the FIS abundance index by estimating R_0 (equilibrium unfished recruitment), M and catchability coefficients. Catchability coefficients relate (exploitable) biomass to the abundance indices. Fits to the data were reasonable. However, the most recent commercial length frequencies used in the model date from 2009/10, and 10m-30m depth waters; more recent length data are available from the FIS.

Recommendation

- The data from the FIS are valuable and every effort should be made to use all the data collected in the stock assessment model. We recommend an investigation of using FIS length frequency data more comprehensively by fitting the model to it.

The estimated base case depletion of spawning biomass was $0.33B_0$ and corresponding exploitable biomass was $0.534B_0$. MSY was calculated to be 218 tonnes and spawning biomass corresponding to MSY (B_{MSY}) was $0.225B_0$. The Committee noted that the difference between a limit reference point of $0.2B_0$ and B_{MSY} is small and needed to be taken into account when setting harvest control rules, so as to avoid annually fluctuating TACCs.

Recommendation

- The developing harvest strategy should consider the relationship between the current estimate of B_{MSY} and B_{20} when developing a target reference point.

A range of sensitivities were explored; one of the largest sensitivities was the assumed harvest prior to 1969-70. Increasing these assumed catches resulted in a reduction in spawning biomass depletion by about 4%. The amount of historical recreational catch of lobster is a large uncertainty in the model. Unpublished sensitivity analysis indicates that the assumed historical recreational catches will affect stock productivity and MSY estimates.

Recommendation

- The Dept explore options for refining precision and accuracy of recreational catch estimates.

The spatial structure of the fishery is notable and the amount of data from the depth strata has been informative. Integrating these data, (i.e., CPUE and FIS length data), from the different depth strata of the fishery more formally into the assessment model could provide a more robust stock estimate.

Economic considerations

The ERL Fishery is a mature quota managed fishery. While export opportunities exist and have been utilised in the past, the fishery predominantly services the domestic market with most product sold within NSW. The fishery has shown

remarkable resilience to recent economic impacts from COVID-19, including on the volume of restaurant trade and increased competition on the domestic market from lobsters from other Australian fisheries (e.g., WA rock lobster) that were previously exported.

GVP and Pricing Information

The annual ERL beach price is calculated based on daily price data provided by the Sydney Fish Market (SFM) and is the average estimated value of all ERL sold. The volume of ERL sold through SFM is significant but variable between years - 41%, 38% and 32% of the commercial harvest being consigned respectively in the 2017-18, 2018-19 and 2019-20 seasons.

The beach price for the 2018-19 and 2019-20 fishing periods was \$80.42 and \$76.46 per kilogram, with a nominal estimated gross value of production (GVP) of \$13.67M and \$12.97M respectively. For the (incomplete) fishing year of 2020-21, the beach price is \$66.63/kg, although some commercial fishing businesses reported an increase in price after this calculation was made. Commercial ERL fishers utilise a range of other outlets for sale, including co-operatives and direct sales. Commercial ERL fishers report that the SFM price generally overestimates the price obtained by fishers in other markets. Nonetheless, SFM data still represents a consistent index of price over time.

There is a price differential for ERL based on size with small lobsters averaging \$73.01/kg and extra-large \$82.94/kg. Commercial ERL fishers reported that if they were permitted to harvest lobsters greater than the current maximum legal size, a further size-based price premium would most likely be obtained. There is the ability for most commercial ERL fishers to target different sized lobsters depending on the depth of the water they fish. Given the price differential based on lobster size, high grading (returning smaller legal-size lobster live to the water) to better utilise economically available quota units is occurring. This is common in quota managed fisheries where the quota does effectively limit total catch and where there is a price differential based on individual size of the quota species. There is some evidence this has increased over time in response to the rebuilding stock, as overall catch rates of legal sized ERL have increased.

There is a seasonal aspect to ERL price with Figure 1 presenting information on average monthly price (\pm s.e.) between August 2017 and March 2021. Price is lower between January and April and between these months except for April, prices also tend to be more variable during this period. Average price is lowest in March ($\$64.87 \pm \5.90) and highest in June ($\$84.75 \pm \2.23).

There is reason to believe that lobster price is influenced by within season catch volume and this was reinforced by ERL fishers at the TAFC meeting. Factoring in monthly variation, there is a weak negative correlation between price and volume (Figure 2). As this calculation is based on data aggregated across the fishery, a clearer relationship is likely to be evident if data analysed incorporated information at the individual business level.

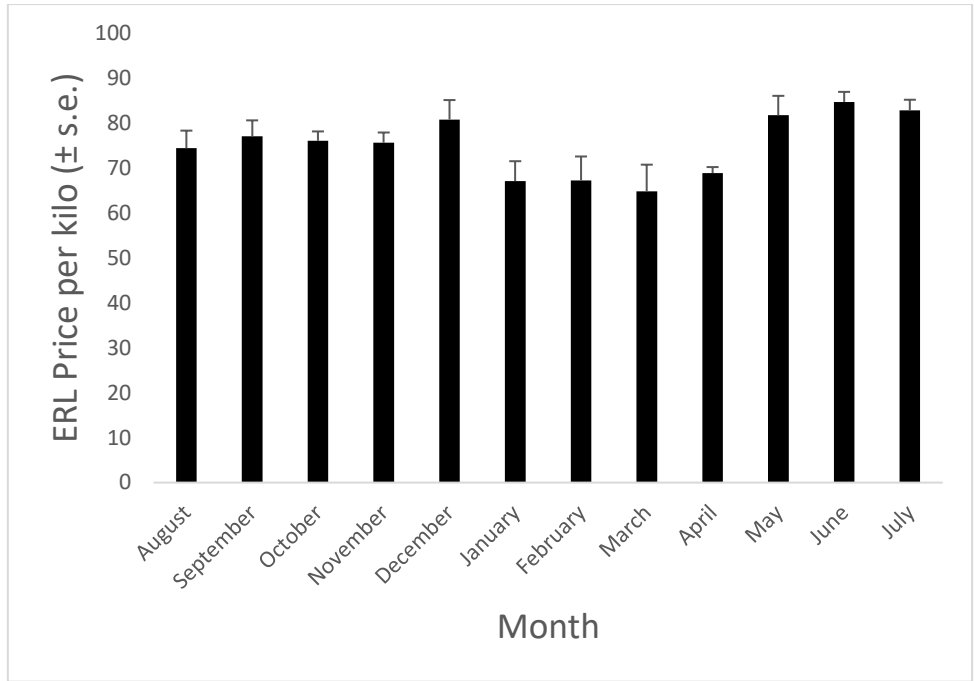


Figure 1. Average (\pm s.e.) monthly ERL prices between August 2017 and March 2021. (Data is from SFM prices sourced by the NSW Department of Primary Industries)

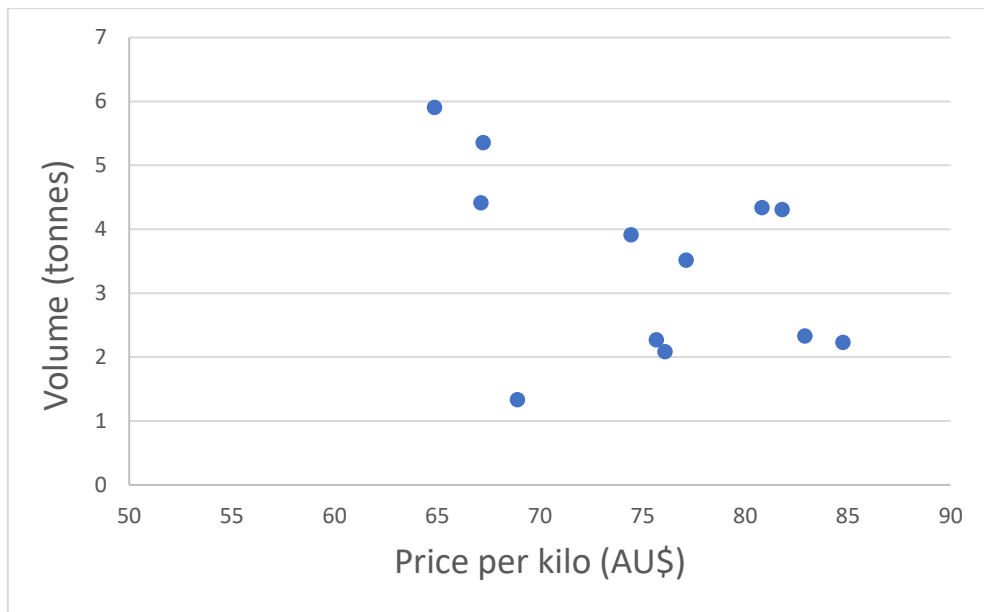


Figure 2. Relationship between landed volume (tonnes) and price per kilo of ERL. (Data is from SFM prices sourced by the NSW Department of Primary Industries)

There is some uncertainty in the short term regarding the future price of ERL. This uncertainty is driven by international trade arrangements, which are likely to see ongoing reduction in the export volume of Australian rock lobsters and an increased volume available on domestic markets. While the ERL mostly caters to a domestic market its price is potentially vulnerable to competition. The current outlook requires caution rather than significant concern given the resilience of the ERL fishing businesses to date. Commercial ERL fishing businesses communicated a clear understanding of the risk to price from competition and the need to have strategies in place to mitigate the risk.

CPUE and Economic Effects

CPUE has been increasing in the fishery and given how the fishery operates, this increase is likely to have contributed to a reduction in some of the variable costs in the fishery. For example, industry representatives communicated that successful fishing operations were requiring a reduced number of pots, a reduced amount of bait and a reduction in fuel use in some instances. Any such reductions however have not currently been verified or quantified with empirical information.

Shareholdings

From the information provided by the Department, the number of shareholders has decreased from 174 in 2000 to 99 in 2020/21². However, the number of shareholders has not changed significantly since 2016/17 and neither have the number of authorised or nominated fishers. The information is consistent with a fishery that has stabilised in terms of ownership following the introduction of quota management. Shareholdings remain spread over fisheries regions, but with greater concentrations between Coffs Harbour and Port Stephens and the Central Coast and Illawarra.

Share leasing was high in volume in the period between 2000-01 and 2007-08 at average prices between approximately \$1,500 and \$3,000 per share. From 2014-15 the lease price per share has risen except for 2019-20 which coincided with initial economic uncertainty of the COVID-19 pandemic. A caveat in terms of interpreting share price information is that recording information on share price is voluntary and some trades may have been between related business entities. The latter is likely to result in a different lease price than would be reflected on the open market.

In the 2019-20 fishing period, there were 15 share transfers processed for a total of 529 shares, equating to a total nominal value of \$5,688,260, and a nominal weighted average value of \$10,752 per share for trades reporting price. In the incomplete 2020-21 fishing period, there have been six share transfers processed for a total of 187 shares, equating to a total nominal value of \$2,618,000, and a nominal weighted average value of \$14,000 per share for trades reporting price. Overall, there has been a substantial increase in the value of shares over the life of the quota managed fishery. The active investment is indicative of confidence in the stock and the fishery, and an expectation of a positive return on investment at the price paid.

² *Management Report* – NSW Lobster Fishery determination for 2021/22 fishing period. NSW Department of Primary industries, 2021

Future Economic Data Needs

The Department has engaged BDO EconSearch to produce an annual time series of economic and social indicators for NSW commercial fisheries. This report will further assist better understanding of the economics of the ERL Fishery, including prices obtained outside of the SFM.

In terms of ongoing data collection, further refinement of share price information would be beneficial and this should include recording share price on all transactions and identifying transactions between related business entities.

Fishery management considerations

The ERL Fishery has a long history in NSW, with many changes made to how it is managed³. Particularly relevant to the current fishery are the reforms of the 1990s and early 2000s. During this time key regulatory arrangements were introduced including share management, lobster tags, minimum and maximum size limits and output controls (TACCs and ITQs). Collectively these reforms aimed to rebuild the fishery, as catch had declined to around 100 tonnes per annum and the spawning stock had been depleted to less than 10% of its initial size.

Twenty years later the reforms have proven a success and the TACC has steadily been increased to 180 tonnes in 2020-21. The increase in TACC has been supported by favourable environmental conditions, which have seen puerulus settlement steadily increase over the past 15 years (see science section for further information). The catch against TACC has followed the upward trend with the TACC always more than 95% caught. This means the output control system is working as it should, constraining catch and encouraging ITQ holders to take their catch in a way that gets the best economic return. Furthermore, the market for NSW lobster has also improved with increasing prices and share values over the same period (see economics section for further information). It is also pleasing to see that despite the COVID-19 pandemic, the TACC is on track to remain almost fully caught in 2020-21, even though beach prices have declined.

Looking ahead, the process of developing a harvest strategy for the fishery is well underway and provides an opportunity to consider the necessity of the current rules in the fishery, including the current minimum and maximum size limits. The current rules have served the fishery well during the rebuilding phase, but the spawning stock is now estimated to be of a size that can produce MSY (30-35% of initial spawning biomass). Maintaining the spawning stock around this level should be a key objective of the harvest strategy. For government and industry, how to maximise the yield from the fishery, in terms of both tonnes and value, while working within the harvest strategy rules requires further consideration, noting that there are linkages between the two.

³ Management Report – NSW Lobster Fishery determination for 2021/22 fishing period. NSW Department of Primary industries, 2021

Non-commercial catch comprises the recreational, Aboriginal and illegal, unregulated and unreported (IUU) catch. Estimates of the recreational and IUU catch are significant while the reported Aboriginal catch is less than 1,000 lobsters per year. Despite several surveys over the past 25 years, recreational catch estimates remain uncertain. Given the range of estimates a proxy of around 10% of the commercial catch has been used in the assessments to represent the non-commercial catch (recreational and indigenous). The IUU catch in the lobster fishery is described as an estimate of the unreported commercial catch and has been set at 8.5% of the commercial catch. The TAFC's view of these non-commercial catch estimates is that they are more likely to be overestimates, given they have been automatically rising with the commercial TACC.

Members of both the recreational and commercial sectors present at the TAFC stakeholder meeting on 5 May 2021 queried both the recreational and IUU catch estimates. However, in the absence of any better estimates they are appropriately used in the stock assessment. The TAFC encourages the Department, recreational and commercial sectors to continue to work together to refine non-commercial catch estimates, including considering not tethering them to changes in the commercial TACC.

Fishery compliance is generally good across all fishing sectors, but given the value of lobster there is a need for continual vigilance for, and investigation of, non-compliant fishing activity. NSW Fisheries Compliance is well-aware of this, when conducting both general and targeted inspections and investigations. The TAFC has requested that NSW Fisheries compliance clarify the nature and categorisation of offences, so it can better understand the risks they present to estimating each fishing sectors catch and total fishing mortality.

Rather than recommend any changes to management at this time, or to the current TACC of 180 tonnes, the TAFC requests that this report be considered as part of the continued harvest strategy development process that is scheduled to be completed in time for determining the 2022-23 Eastern Rock Lobster TACC.

Determination

The Total Allowable Fishing Committee, pursuant to Part 2A of the *Fisheries Management Act 1994*, determines that the commercial catch of Eastern Rock Lobster should be controlled and allocated through the following measure:

- A TACC of **180 tonnes** during the fishing period 1 August 2021 to 31 July 2022.

Species	Catch Limit 2021/22 (tonnes)
Eastern Rock Lobster (<i>Sagmariasus verreauxi</i>)	180

Signed (for and on behalf of the TAFC)



William Zacharin
Chair, TAFC

24 May 2021