

NSW TOTAL ALLOWABLE FISHING COMMITTEE

EASTERN ROCK LOBSTER FISHERY

DETERMINATION FOR THE 2022/23 FISHING PERIOD

17 June 2022

Executive Summary

Preamble

The New South Wales (NSW) Total Allowable Fishing Committee (TAFC) 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 TAFC 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 TAFC 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 TAFC is not subject to the control or direction of the Minister as to any determination made. However, the Minister may direct the TAFC on the procedures to be followed and the matters to be taken into account in making a fishing determination. A formal Harvest Strategy (HS) for the Eastern Rock Lobster Fishery was approved by the Minister in May 2022 and the TAFC has given due consideration to this strategy in determining the TACC.

This determination is for Eastern Rock Lobster for the period 1 August 2022 to 31 July 2023.

Management recommendations & supporting actions

The TAFC 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 FIS are valuable and every effort should be made to use all the data collected in the stock assessment model.
2. The ERL assessment model should be peer reviewed and compared for best practices in other Australian rock lobster fisheries.
3. DPI reviews the estimates for recreational, unreported commercial catches, bycatch from other fleets and compliance seizures for the rock lobster fishery as a high priority and in doing so considers:
 - conducting a new survey to update the estimate of unreported commercial catch,
 - conducting a specific recreational catch and effort survey for rock lobster, and
 - developing a HS rule to deal with rock lobster mortality from other sources, including other fleets and compliance seizures, when $B_{\text{current}} < B_{\text{osy}}$.
4. DPI, with industry support, sets a minimum level of compliance to be achieved in the fishery over the next three years and moves towards 95% compliance levels in future years. This should be the targeted outcome for a high value quota management fishery.

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 **200 tonnes** during the fishing period 1 August 2022 to 31 July 2023.

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 commercial 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 2020-21, there were 99 lobster fishery shareholders with 73 authorised fishers¹.

The ERL Fishery is considered sustainable. Gross value of production for 2020-21 was estimated at approximately \$11.89 million.

The TAFC met with a number of shareholders in the ERL Fishery in Sydney on 1 June 2022 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 (DPI). A current stock assessment report on the fishery was also provided to the Committee by the Department².

Biological considerations

Eastern Rock Lobster 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 depths 10 –

¹ Giles, N (2022) Management Report – NSW Lobster TAC determination for the 2022/23 fishing period. *NSW Department of Primary Industries*.

² G.W. Liggins, M.E. Miller & G. Ballinger (2022) RESOURCE ASSESSMENT: Eastern Rock Lobster (*Sagmariasus verreauxi*). *NSW Department of Primary Industries*.

120m. Larvae progress through a pelagic phase to a post-larval stage (pueruli) which then settle on nearshore rock 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. 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 sub-legal length lobsters;
3. an index of recruitment from a fishery independent puerulus survey, conducted annually.
4. A size-based assessment model fit to some length frequencies, commercial CPUE, and the spawning biomass index from the FIS

The assessment model depended strongly on the total number of lobsters 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 7.7% of the total commercial catch and the former 9.1% means that total removals were assumed to be around 16.8% higher than the reported commercial catch. These values have declined since last year, but the assumptions on which they are based have not been re-visited for more than 10 years and have large implications in setting a TACC based on the TAC.

Commercial catches have steadily risen since the early 2000's, effort declined and CPUE consequently increased. We noted that the CPUE in the last two fishing periods (2019/20 and 2020/21) increased substantially over previous years. A leading indicator of sub-legal CPUE for the 2021/22 season indicates that CPUE is likely to continue to increase.

Recent estimates of puerulus settlement indicate a long-term increasing trend since 1995/96. Southern sites in Sydney and Tuncurry are uncertain however, as a result of COVID-19 operating restrictions, but are likely to be biased low rather than high, due to inability for staff to service the collectors. The Committee notes major flooding in 2021 and 2022, particularly on the north coast of NSW and the possible effect on the fishery and stock.

The FIS results from last year indicate that a cohort of sub-legal lobsters is starting to enter the fishery and abundances are increasing. 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 on 150 mm lobsters entering the fishery last year somewhat predicted the commercial CPUE increase that were experienced this 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. The revised model was fit to commercial CPUE and "some" length frequencies and the FIS abundance index by estimating R_0 (equilibrium unfished recruitment), natural mortality (M) and catchability coefficients. Fits to the data were reasonable. However, the most recent

commercial length frequencies used in the model date from 2009/10 and 10m-30m water depth, while 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.

The estimated base case depletion of spawning biomass was $0.34B_0$, and corresponding exploitable biomass was $0.538B_0$. MSY was calculated to be 222 t and spawning biomass corresponding to MSY (B_{MSY}) was $0.224B_0$. The Committee noted that the difference between a limit reference point of $0.2B_0$ and B_{MSY} is small and the target spawning biomass is according to the harvest strategy at $0.306B_0$. The estimated spawning biomass is currently above the target reference point.

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.

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.

Recommendation:

The ERL assessment model should be peer reviewed and compared for best practices in other Australian rock lobster fisheries.

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 - 38%, 32% and 32% of the commercial harvest being consigned respectively in the 2018/19, 2019/20 and 2020/21 fishing periods.

The beach price for the 2019/20 and 2020/21 fishing periods was \$76.46 and \$66.10 per kilogram, with a nominal estimated gross value of production (GVP) of \$12.97M and \$11.89M respectively. For the (incomplete) fishing year of 2020/21, the beach price is currently \$62.82/kg. While prices have shown a decline, this is understandable given the impacts of COVID-19 and restrictions associated with it.

Commercial ERL fishers utilise a range of other outlets for sale, including co-operatives and direct sales. Commercial ERL fishers report that compared to SFM prices, prices obtained in these other markets may vary, but SFM data still represents a consistent index of price over time.

In the 2019/20 season, there was a price differential for ERL based on size with small lobsters averaging \$73.01/kg and extra-large \$82.94/kg. Industry advice received at the time suggested that such a price differentiation was normal. However, in the 2020/21 season such differentiation was dampened. Small ERL averaged \$61.12/kg, while extra-large averaged \$64.28/kg. Large lobster averaged a similar price as small lobster at \$61.47/kg. The specific reasons for this are unclear but highly likely to be related to COVID-19 and associated restrictions, including capacity limits in restaurants and at functions, which had reduced the size and frequent of banquet style meals.

There remains short term uncertainty regarding the future price of ERL. This uncertainty is driven primarily by international trade relationships, competition, and transport logistics (and costs). 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. The industry has sort opportunities for market diversification and is pursuing third party environmental accreditation.

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 many instances. Any such reductions however have not currently been verified or quantified with empirical information.

Shareholdings

From the information provided by NSW DPI in the *Management Report – NSW Lobster Fishery Total Allowable Catch Determination for 2022/23* the number of shareholders has decreased from 174 in 2000 to 99 in 2020/21 and 97 in the current fishing year. The number of shareholders has not changed significantly since 2017/18 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 transfers (or more correctly 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 nine share transfers processed for a total of 289 shares, equating to a total nominal value of \$3,107,575, and a nominal weighted average value of \$10,753 per share for trades reporting price. In the 2020/21 fishing period, there were 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.

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 with many changes made to how it is managed. 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 (total allowable commercial catches (TACCs) and individual transferable quotas (ITQs)). Furthermore, the recreational fishing possession limit was reduced from five to two in 1993. 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 0.10B₀.

Twenty years later, these management reforms have proven a success and the TACC has been steadily increased to 180 tonnes in 2020/21. The increase in TACC has been supported by improving puerulus settlement over the past 15 years and strong year-classes entering the commercial fishery. The catch against TACC has followed the upward trend, with the TACC now almost 100% caught as quota trading has improved. 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 provides the best economic return. It is reassuring that, despite the COVID-19 pandemic, the TACC was fully caught in 2020/21 and is on track to do the same in 2021/22.

A harvest strategy (HS) for the fishery was recently approved by the Minister and provides key guidance to the TAFC in determining the TACC. The spawning stock is now at 0.34B₀, above the target reference point of 0.31B₀. The recommended TAC from the model applying the new HS is 229.3 tonnes, from which other sources of human induced mortality must be deducted to determine the TACC. Those other sources of mortality are considered below and include non-commercial catch (recreational and Aboriginal), unreported commercial catch from within the commercial rock lobster industry, bycatch in other fisheries and illegal catch arising from compliance seizures. Note that there may be some overlap between unreported commercial catch and compliance seizures.

Estimates of non-commercial and unreported commercial catch are explicitly included when determining the TACC, where-as bycatch from other fisheries and compliance seizures are not. An estimate of the non-commercial catch (recreational and Aboriginal) was made by DPI in 1994/95 and set at 10% of the total commercial catch at the time (93.1 t), that is, 9 t. The total commercial catch comprised 79.6 t reported plus 13.5 t unreported (17% of the reported catch).

As noted above, the unreported commercial catch was set at 17% of the reported commercial catch in 1994/95 and then reduced to 15%, based on a survey of 28 commercial rock lobster fishers in 2000. The 15% survey figure equated to about 15 tonnes at the time, as the reported commercial catch was 102 tonnes.

Subsequently, the percentage was linearly reduced to 8.5% by 2010/11, based on further advisory committee and industry advice. There has been no change since 2010/11, apparently because there has been no strong objection from stakeholders to the 8.5%, irrespective of what commercial tonnage that equates to.

The current estimates of non-commercial and unreported commercial catch are 9.09% and 7.73% respectively, which equates to 20.8 t and 17.7 t, for a total of 38.6 t.

The TAFC has concerns about the estimates for recreational and unreported commercial catch, particularly as they are pegged (as a percentage) to the commercial catch, no matter what level it is. The justification for this remains poor. Furthermore, the basis for the estimates is 22 to 27 years old and may not represent the current situation. For example, recreational fishing surveys since the 1994/95 estimate have shown variable results, with recent surveys suggesting an annual catch of 5-6 t, well below the 20.8 t proposed by DPI and included in the TACC model calculation for 2022/23. In addition, the process used to reduce the estimated 15% unreported commercial catch estimate from 2000 to 8.5% raises potential conflict of interest issues, as advice was sought from those who would directly benefit from a lower percentage. For 2022/23, the DPI proposed amount is 17.7 t, which is co-incidentally similar to the ~15 t from the 2000 survey, but only because of recent increases in the commercial catch.

The other relevant consideration for the TAFC is the increase in the recreational possession limit from 2 to 3 lobsters under the HS, when the TACC is greater than 150 t. No estimates of the impact of this increase on fishing mortality have been made. However, the TAFC is required to account for this catch and has decided to

use 3 t, as this represents 50% more than the higher of the two most recent recreational surveys (6 t) taking the recreational catch to ~9 t per annum. Note that this is similar to the original estimate of DPI from 1994/95 of ~9 tonnes for the non-commercial sector. Given that the reported Aboriginal catch is currently estimated at less than 1,000 lobsters per year (< 1 t) the recreational catch estimate is probably ~8 t. The proposed use of 20.7 t by DPI is an artifact of the increasing total commercial catch, partly justified by an assumption that recreational catch is directly linked to rock lobster abundance in less than 10m of water. However, no evidence has been presented regarding any increased abundance of legal sized lobsters in less than 10m of water over the last 20 years, or what the relationship is between abundance and recreational catch.

Other sources of fishing mortality, including bycatch from other fishing fleets and compliance seizures, are difficult to estimate. Demersal fish and prawn trawling have been historically associated with significant rock lobster bycatch and it would be expected that their level of fishing effort affects the amount of bycatch, all other things being equal. However, fishing effort in both the NSW and Commonwealth trawl fleets that overlap the range of the ERL stock has been declining for the past 25 years and therefore so should the level of bycatch. The survival rate of released lobsters is unknown. In relation to compliance seizures, the trend in these (size and frequency) is difficult to determine from the available data.

Given the considerations above and the challenges in estimating sources of fishing mortality where there is an acknowledged paucity of data, it is difficult for the TAFC to support the DPI proposed deduction of 38.6 tonnes for non-commercial and unreported commercial catch from the TAC. Members of the commercial sector present at the TAFC stakeholder meeting on 1 June 2022 also queried the non-commercial and unreported commercial catch estimates, but there was no coherent and defensible response received. A recreational representative was not able to attend the meeting. Noting the many deficiencies in the data, the TAFC's best estimate is 25 t, made up of 1 t Aboriginal, 9 t recreational (which includes the increase in the recreational possession limit from 2 to 3) and 15 t unreported commercial catch.

Estimating rock lobster mortality from other sources, including other fisheries and arising from compliance seizures, was problematic, but with the overall trend more likely to be downward over recent decades for the reasons described above. There was no means of quantifying this mortality and it will be difficult to do so. Given these circumstances, the TAFC's view was that provided the stock was above B_{osy} , this amount can be reasonably set to zero³.

In summary, the TAFC is of the view that there is low justification for the current non-commercial and unreported commercial removal estimates and from our calculations there is an approximately 13 t difference between the TAFC's estimate of other sources of fishing mortality (25 t) and that applied by DPI (38.6 t) in the stock assessment report. If the difference was added to the TACC recommendation of 191

³ However, if the stock is ever below B_{osy} , some deduction should be made, based on a new HS decision rule. To the extent possible, data and/or intelligence should be used to decide the new rule.

tonnes from the DPI model output, then the 2022/23 TACC could be 204 tonnes. However, this breaches the HS large change rule of 20 t, so the TACC would be limited to 200 tonnes. The TAFC regards the application of the large change rule in this circumstance as reasonable in providing an additional level of precaution given old, uncertain and absent data.

Recommendation:

DPI reviews the estimates for recreational, unreported commercial catches, bycatch from other fleets and compliance seizures for the rock lobster fishery as a high priority and in doing so considers:

- *conducting a new survey to update the estimate of unreported commercial catch,*
- *conducting a specific recreational catch and effort survey for rock lobster, and*
- *developing a HS rule to deal with rock lobster mortality from other sources, including other fleets and compliance seizures, when $B_{current} < B_{osy}$.*

As the recreational possession limit is now linked to the TAC in the HS, it is imperative that up to date and appropriately precise estimates of recreational lobster catch are obtained to ensure that fishing mortality from this sector is understood and factored into decision making.

Regarding compliance, the TAFC had requested that DPI 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. While some progress has been made, there remains no reliable estimate of non-compliance as it relates to total fishing mortality. However, the reported compliance rate of 62% for the commercial sector in 2020/21 is of concern, given the nature of the offences (failure to real time report, no tags and incomplete logbooks). While several instances of non-compliance may not directly be associated in actuality with increased fishing mortality above permissible limits, the types of compliance issues described do potentially enable quota evasion and thus present a risk to the integrity of the quota management system overall.

It is disappointing that commercial fishery compliance rates have varied between 45% and 80% over the past decade, with little improvement. This variation over time in compliance rates may be associated with the frequency and scale of targeted compliance activities, however the available information does not allow an understanding of the influence of this potentially confounding factor. The TAFC encourages the continued development of a risk-based approach to compliance, that is supported by intelligence to deliver estimates of fishing mortality associated with quota evasion in the rock lobster fishery. The industry must also take some responsibility for this poor performance, as it will affect the public reputation of the fishery.

Recommendation:

DPI, with industry support, sets a minimum level of compliance to be achieved in the fishery over the next three years and moves towards 95% compliance levels in future

years. This should be the targeted outcome for a high value quota management fishery.

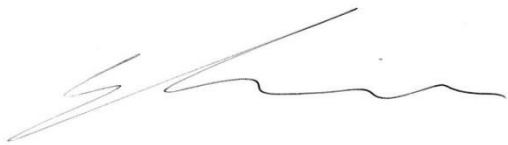
Determination

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 **200 tonnes** during the fishing period 1 August 2022 to 31 July 2023.

Species	Catch Limit 2022/23 (tonnes)
Eastern Rock Lobster (<i>Sagmariasus verreauxi</i>)	200

Signed (for and on behalf of the TAFC)



William Zacharin
Chair, TAFC

17 June 2022