NSW TOTAL ALLOWABLE FISHING COMMITTEE

SEA URCHIN AND TURBAN SHELL RESTRICTED FISHERY: RED URCHIN

DETERMINATION FOR THE 2023 FISHING PERIOD

9 November 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.

This determination is for the Sea Urchin and Turban Shell (SUTS) Restricted Fishery for the period 1 January to 31 December 2023. The Red Urchin fishery is a part of the SUTS multi-species restricted fishery that is managed by a combination of input controls (e.g., minimum size limits) and individual transferable quotas (ITQs). A TACC and equal ITQs are only applied to the Red Urchin. There are 37 SUTS holders in the fishery and each endorsement has received an annual ITQ of 1,622 kg for Red Urchin under a TACC of 60 tonnes since 2002. The Red Urchin ITQ cannot be separated from the SUTS endorsement and ownership cannot be permanently transferred amongst endorsed fishers, but the quota can be leased within a fishing period. Concerns about a reduction in individual quota allocations for active divers if the TACC is reduced, coupled with constraints at leasing quota, has made changing the TACC problematic since it was first implemented in 2002.

Due to economic and social considerations with the temporary transfer of quota within a fishing period, the TAFC supports the setting of Regional Catch Limits (RCLs) across five (5) regions to ensure those fishers that specifically target Red Urchins can continue to effectively operate in the fishery (Appendix 1). RCLs may also provide some protection against overfishing and serial and/or localised depletion in fished areas.

Region 4 has contributed over 60% of the total catch in the current fishing period. In both Regions 3 and 4, historical and recent peaks in fishing effort and catch have been followed by rapid and substantial declines in catch rate. A similar pattern was historically seen in Region 2, with periods of increased catch being followed by rapid declines in catch rate. These declines in catch rate indicate that the stock is subject to serial localised depletion, even at the relatively low catch levels reported in recent years.

The Red Urchin fishery has been subject to substantially lower fishing effort in the past three fishing periods, due to COVID-19 restrictions, floods and bad weather for diving activities. Total catch is historically low over the past three fishing periods.

Declines in catch per unit of effort (CPUE), which is used as an index of abundance, need to be arrested if the fishery is to return a harvest more consistent with historic yields. Given the currently very low CPUE in open areas, the protection of spawning adults in closed areas and the minimum size limit (MSL) become important management settings to assist stock rebuilding. Given the reliance of the future fishery on that part of the stock in closed areas and the possibility that those areas may be reopened for Purple Urchin fishing, knowing its status is the top research priority for fisheries management.

A TAFC meeting was held with interested SUTS shareholders on 26 October 2022 and representatives from the NSW Department of Primary Industries (Fisheries). Various management issues were discussed, including the market impact of COVID-19, bad weather affecting diving opportunities and declining catch rates over the past three fishing periods. An updated fisheries statistics summary was provided by NSW DPI (Chick 2022)[1].

Management recommendations & supporting actions

The TAFC provides the following research recommendation to the Minister, NSW Fisheries and the SUTS fishing industry towards improving the management of the fishery:

1. CPUE plots should indicate the years minimum size limit changes were made as this will affect (bias) the indicator.
2. An assessment of stock status is undertaken as a priority in closed areas to determine the overall NSW stock status of Red Urchin given its poor status in areas open to fishing.

[1] Chick, R.C. (2022) Fishery statistics summary 2022 – Sea Urchin and Turban Shell Fishery – Red Sea Urchin (*Heliocidaris tuberculata*). NSW Department of Primary Industries. 19 pp

Determination

The Total Allowable Fishing Committee, pursuant to Part 2A of the *Fisheries Management Act 1994*, determines that the commercial catch of Red Urchin in the NSW Sea Urchin and Turban Shell restricted fishery should be controlled and allocated through two separate, but dependent measures:

1. A TACC for Red Urchin during the period 1 January to 31 December 2023 of **30 tonnes**; and
2. Regional Catch Limits (RCLs) across the specified five (5) regional zones that collectively should not exceed **9.5 tonnes** as follows:

Region	**Catch Limit 2023 (tonnes)**
1	1.18
2	2.45
3	3.06
4	2.81
5	0
Total	**9.50**

Introduction

The commercial harvest of Red Urchin in NSW is managed as part of the Sea Urchin and Turban Shell (SUTS) Restricted Fishery. The SUTS fishery is a declared restricted fishery under Division 1 of Part 9 of the *Fisheries Management (General) Regulations 2019*, pursuant to Section 111 of the *Fisheries Management Act (NSW) 1994*. The commercial fishery for Red Urchin is managed through a combination of input (minimum size limit; spatial closures) and output controls (quota; regional and state-wide catch limits).

The commercial Red Urchin (RU) fishery commenced in 1999 with a peak harvest of 85.5 tonnes in 2000. Early concerns about overfishing resulted in a total allowable commercial catch (TACC) being established in 2002 at 60 tonnes. Commercial harvest has remained well below the 60 tonne TACC since 2002. However, as a small number of fishers target RU in the SUTS fishery, this TACC has continued to be equally allocated between the 37 endorsement holders.

To further restrict high levels of fishing effort and serial depletion, Regional Catch Limits (RCLs) were introduced into the fishery in 2001. The commercial catch has never reached the combined RCLs, or the TACC and this is of ongoing concern for the fishery management, based on evidence of declining catch rates and a historically low total catch. It is now necessary to reduce the TACC and corresponding RCLs to assist stock rebuilding.

Biological considerations

Red Urchin (*Heliocidaris tuberculata*) are slow growing with low biological productivity compared to Purple Urchin (*Centrostephanus rodgersii*). Areas closed to fishing and a minimum size limit (MSL), are used to prevent overfishing of the NSW stock. The 2020 status of the overall NSW stock was declared ‘Sustainable’ by definition, based on the amount of area closed to fishing even though the population in the closed areas has not been re-surveyed since 2000. Given this, the current stock status of Red Urchin is best described as unknown with any opening of closed areas to commercial urchin fishing adding further uncertainty.

The fishable stock outside the closed areas was declared depleting in 2020, as both catch rates (CR) and catches have either recently declined or been at historically low levels. The stock assessment in 2022 is based on updated fishery statistics which indicate that the RU stock was lightly exploited last year. Targeted (RU only) and Incidental catch (across the whole fishery) has continued to decline, in both Fisher Days and Hourly Catches this year to a total less than 2 tonnes. More than half the catches have come from Region 4. Discussion with stakeholders centred on diver/operator shared gear (T-pieces on hookahs), which may further confound estimates of variability in the data.

Catch Rate (CR) data were aggregated across all zones and tended to be higher compared to 2020 levels. CR of Red Urchin (only) since 2000 has varied from an initial high of 250 kg/hr to 120 kg/hr in 2016. Since 2016, CR has declined steadily. The Committee however are aware that since late 2019 a Minimum Size Limit (MSL) was set initially at 115mm in 2019 (for a period of three months) and then 95mm in 2020. This will bias the CR data downwards and makes it difficult to compare across years.

Recommendation:

CR plots should indicate the years MSL changes were made as this will likely affect (bias) the indicator.

Compared to the previous fishing period (2022), catch rates are slightly lower and there is a large amount of variability attached to these values, as the effort levels in the fishery were less than half on the previous year. Daily catch rates have tended to decline consistently over the past three years. A confounding factor when interpreting trends in catch rates is the amount of fishing effort that is directed towards targeting RU, compared to fishing effort which is targeting other species in the SUTS Fishery, but during which RU may be taken opportunistically.

The fishery is also likely being affected by environmental events, such as long-term ocean warming, the current La Nina and more localised storms. Industry has reported that the weather conditions on the water and diving in the water have been less favourable to fishing than in other years. It is unclear therefore whether the apparent decline of effort and catch rate is a temporary issue of stock availability, growth overfishing, a continued decline in stock abundance or some combination of all the above.

While this apparent decline in stock abundance indicated by the catch rates is also confounded by changes in the MSL over the past three years, the Committee is concerned that the fishable stock is currently at very low levels. This places a great reliance on the stock in closed areas, if the fishery is to be assessed as sustainable, but this portion of the stock has not been surveyed for over 20 years, making it impossible to know its true status.

Recommendation:

An assessment of stock status in closed areas is undertaken to determine the overall NSW stock status of Red Urchin given poor status in open areas.

Economic considerations

Within the SUTS fishery, the catch of Red Urchin (RU) by volume remains small relative to the catch of Purple Urchin. The market for Red Urchin is domestic, mostly in NSW where it competes with Purple Urchin caught in NSW and Tasmania. Most Red Urchin product is used in the restaurant trade. The restaurant trade was disrupted because of Covid-19 restrictions, but these disruptions have dissipated in 2022.

The beach price (per kg) of RU has showed an overall increasing trend since 2013. The beach price for the 2021 fishing period was $11.22/kg, with an estimated gross value of production of $54,107. The average beach price for the current fishing period (based on average price data until September 2022) is $15.57/kg, with a year to-date estimated GVP of $22,888. Commercial operators reported that their prices per kg for the current fishing year were about $12/kg. While these prices are historically high, they are based on very low catch volumes. Only six of the 37 endorsed commercial fishing businesses have reported taking RU in the current fishing year. Commercial operators report that market demand for RU remains high and is unmet by supply.

Given the available information on RU price and demand, market factors are highly unlikely (during this fishing period) to be a contributing factor to the low catch relative to the available TACC.

In the 2022 fishing period, there have been five fishing business transfers to date (5 October 2022). However, the provision of price data by fishing businesses is optional and no price data was provided for the 2022 fishing period. Therefore, no information is available to identify trends in the value of fishing business transfers.

The volume of quota traded has ranged between 0.5 t to 9.7 t for the 2009 to 2022 period inclusive. No quota transfers occurred in the 2021 fishing period. In the 2022 fishing period there has been one RU quota transfer to date of 1,622 kg (5 October 2022). The low number of quota trades is not surprising, because the TACC is not constraining the commercial catch.

Fishery Management considerations

For several years now, the RU has been a minor part (< 15%) of the Sea Urchin and Turban Shell (SUTS) Fishery value. Prior to this (2016-19) it accounted for around half the SUTS Fishery value.

Catch has remained well below the TACC and RCLs for three successive fishing periods to 2022 and is now the lowest it has been in more than 20 years (~1.5 tonnes in the first 8 months). Catch rates show a similar downward trend and are now below 50% of the 10-year average. While the Department categorises the stock as ‘Sustainable’, catch and catch rate data suggest it is continuing to decline even at very low harvest levels. Reasons for this may include historic overfishing, extreme weather events, inter-species competition for habitat or climate-induced changes to abundance and/or range.

Written advice from industry about the status of the RU stock was mixed, some thought the TACC and RCLs should remain unchanged, while others thought there should be a reduction. At the TAFC stakeholder forum on 26 October 2022, verbal advice was mixed from observations of ‘depleted stocks’ and ‘low availability’ to ‘we have taken our quota’.

Given the low likelihood that the RU stock would rebound to historically average catch rates in 2023 or 2024, the setting of a constraining TACC and RCLs was problematic. To be constraining, that is, near the current annual catch (1.8 t), the TACC would need to be set at less than 5 tonnes, with RCLs at less than 1 tonne each. An alternative is to close the RU fishery for the 2023 season to support its recovery, but this is best considered if other means of stock rebuilding are regarded as unlikely to be successful.

The TAFC recognised that the economic and social consequences for quota holders of an immediate very low TACC/RCLs is significant, with only a few months for industry to adjust. However, these consequences must be balanced with future harvests low enough to assist the stock to recover. Given this, the TAFC has determined that the Red Urchin Total Allowable Commercial Catch (TACC) be reduced to 30 tonnes in 2023 with the five RCLs reduced to 1.18 tonnes (Region 1), 2.45 tonnes (Region 2), 3.06 tonnes (Region 3), 2.61 tonnes (Region 4), & 0.00 tonnes (Region 5) for a total of 9.50 tonnes in 2023. This is an effective reduction of 10.0 tonnes from the previous RCLs. However, as the catch has not exceeded 9.5 tonnes in the previous three fishing periods, this reduction is unlikely to constrain catch in 2023.

Compliance advice was that around one quarter of inspections of SUTS licensees in 2021 resulted in a compliance breach, a marked improvement on the previous year (2020) and one of the highest compliance rates on record. Minor reporting breaches resulted in written and verbal cautions.

Other (non-commercial) sources of Red Urchin fishing mortality are from recreational fishing, aboriginal cultural fishing and illegal fishing. The Department's qualitative advice is that these catches may collectively amount to no more than five tonnes per annum. At the end of this commercial fishing year this estimate may exceed the annual commercial catch and be impacting on stock status. Having uniform minimum size limits across all fishing sectors is a logical step in better protecting the resource.

Progress against TAFC recommendations

The following recommendations were made by the TAFC in 2020 and 2021 for the 2021 and 2022 fishing years. NSW DPI responses are in italics and indicate limited progress to date:

2021.1 Collection of representative size-frequency distribution information for Red Urchins in fished areas. This could be done cost-effectively by developing a cooperative research project whereby all industry divers provide urchin diameter measurements for the first 50 urchins randomly selected on an agreed number of dives. Data collection should be spread across fished areas to the extent possible under current diving patterns. These size data will inform a realistic understanding of the urchin population structure in the fished areas and how it changes as a result of fishing.

2021.2 Investigate cost-effective options for obtaining snapshots of Red Urchin density and size-frequency distribution in closed areas, to confirm the degree to which these closed areas are supporting healthy populations of urchins that can potentially provide spawning and recruitment to re-populate adjacent fished areas.

DPI has been working on progressing a voluntary size survey for the red urchin and DPI research has progressed an FRDC research proposal through the NSW FRDC Research Advisory Committee, the proposal is specific to Red Urchin and addresses the issues raised in the 2020 TAFC recommendations. It is expected that the proposal will be successful in the next round of FRDC funding.

2022.1 A measure of variability (standard deviations) be considered in catch rate reporting in future years. This may or may not be combined into a catch rate standardisation procedure.

Standard errors have been added in the figures in the research report, regarding measures of CPUE (an improvement on just providing the averages, as was done in previous years). CPUE was not standardised.

The collection of size frequency information is critical to confirm the status of the stock. Data from both fished and unfished areas will be necessary to draw more robust conclusions on the state of the fishery.

Determination

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Signed (for and on behalf of the TAFC)

William Zacharin
Chair, TAFC

Appendix 1: Regions in the Red Urchin commercial fishery