NSW TOTAL ALLOWABLE FISHING COMMITTEE

ABALONE FISHERY

DETERMINATION FOR THE 2021/22 FISHING PERIOD

15 April 2021

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 shareholding or 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.

Management arrangements for the NSW Abalone Fishery can be found in the *Fisheries Management (Abalone Share Management Plan) Regulation 2000*, the *Fisheries Management (General) Regulation 2010* and the *Fisheries Management (Supporting Plan) Regulation 2006*.

This Determination is for the Abalone Fishery for the period 1 July 2021 to 30 June 2022.

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 TAFC recommends that the Abalone Industry and Department complete the development of a NSW Abalone Fishery Harvest Strategy with the aim of implementing it no later than 1 July 2023.

2. In the absence of formal area-based catch limits, legal minimum lengths at current sizes are the most important measure preventing over-fishing of spawning adult abalone. These should be retained at current levels.

3. Options should be explored for gathering information on current densities and size-frequency distributions of abalone underwater, including sub-legal sized abalone. This is important to updating the information gathered during the 2013 fishery independent survey on spatial stock distribution and densities, to ensure that scaled estimates of population density, biomass and harvest fraction by area are reliable. Data on abalone population size-frequency distribution could be cost-effectively collected through use of industry divers to

gather random size-frequency data during a small number of dives each year in each area, as part of a scientifically designed, industry run survey program.

4. Consideration be given to scaling fines for illegal fishing from the current flat $500 to up to $10,000 commensurate with the value of the abalone that is stolen. This would be a greater and more immediate deterrent to reoffending. Abalone special penalties in other jurisdictions can provide guidance in this respect.

Determination

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

1. A TACC of **100 tonnes** during the fishing period 1 July 2021 to 30 June 2022.

Introduction

The NSW Abalone Fishery extends the entire length of the coastline of NSW and is managed as a single management unit, although there are four identified spatial management units within the fishery, which assist in pursuing sustainable management arrangements and monitoring performance of the fishery (table 1). The Abalone Fishery was developed through the 1960s and annual catches peaked around 1,200 tonnes in the early 1970s. This catch was not sustainable and the fishery was restricted in 1980 to control over exploitation. Quota management was introduced in 1989 at 10 tonnes per licence. In the early 2000s, the fishery experienced a sustained period of lower catches, with the TACC dropping to 110 tonnes in 2007/08 and 75 tonnes in 2009/10. The TACC was then increased and ranged between 120 and 130 tonnes from 2012/13 to 2017. Since 2018, the TACC has been set at 100 tonnes.

There are currently 45 shareholders in the fishery with shareholdings between 10 and 90 shares from a total pool of 3,454 shares. Only 35 shareholders hold the required minimum number of shares (70) to have an endorsement that authorises the taking of abalone. Quota can be traded within each fishing period, with a maximum of twice the initial shareholding able to be transferred to their existing shareholding.

Table 1: Spatial management units and fishing areas in the NSW Abalone Fishery

Spatial Management Unit	Fishing areas
1	Tweed, Port Stephens, Kiama, Ulladulla, South Brush, Batemans
2	Tuross, Narooma, Bermagui, Bunga, Moon Bay, Turingal, Long Beach
3	Eden, Saltwater, Bittagabee, Green Cape, City Rock
4	Wonboyn, Saltlake, Howe

The Abalone Fishery is subject to a range of spatial closures arising from the comprehensive system of marine protected areas in NSW waters, that includes marine parks, aquatic reserves and intertidal protected areas in which commercial fishing is restricted or prohibited.

Abalone are subject to a regulated legal minimum length (LML) to assist in protecting the stock from over exploitation and ensure fish mortality does not result in the depletion of reef systems, whereby all abalone are removed. The LML for commercially harvested abalone was increased from 117 mm to 119 mm in 2018 and further increased to 120 mm and to 125 mm south of Womboyn in 2019. Recreational fishers are subject to a LML of 117 mm.

An annual assessment of the Abalone Fishery is commissioned each year by the Department of Primary Industries, with support from the Abalone Council of NSW[1]. The TAFC met with fishery scientists, fishery managers and participants in the Abalone Fishery in Merimbula, NSW on 22 March 2021 to discuss the current fishery

[1] Abalone Council of NSW (2021) Assessment of Abalone stocks in NSW: Submission to the TAC setting process for 2021/22, Sydney

assessment and economic conditions in the fishery. Shareholders, divers and abalone processors reported that the impact of the recent bushfires and COVID-19 market disruptions continue to significantly affect the operation of the fishery. It was recognised that there has been a significant undercatch of the TACC in the past two fishing periods due to these events.

Biological considerations

Biology and stock structure

The NSW abalone fishery harvests the Blacklip Abalone (*Haliotis rubra*). Larvae of this abalone are planktonic for the first week or so after spawning and may be distributed some distance from the spawning adults by ocean and tidal currents. However, once settled, abalone are highly resident, forming non-migratory aggregations on suitable reef habitat, often in substantial localised densities. These aggregations are typically genetically indistinguishable from one another and do not constitute separate biological stocks.

Blacklip Abalone are slow growing, taking five years to reach maturity and attaining a maximum age of 20 to 50 years[2]. Without migration of adults to replace those taken by fishing, and coupled with slow growth, aggregations can be rapidly fished down. Abalone are therefore susceptible to serial localised depletion under heavy fishing pressure, with depleted areas potentially taking decades to re-populate. Abalone aggregations exhibit the same dynamics as separate stocks when fished and, for this reason, are spatially managed in many parts of the world, with relatively small areas being managed as separate management units.

There are no separate stocks defined for NSW abalone. The coast has been divided into four separate spatial management units (SMUs), with 21 smaller fishing areas and numerous sub-zones across these SMUs, for the purposes of logbook catch and effort reporting and calculation of performance indices. Separate 'catch targets' were recommended by the previous TAFC for the four SMUs, subdividing the total TACC in proportion to the estimates of relative biomass in the four SMUs. However, these separate catch targets are not enforced as SMU TACCs, but serve as guidelines for voluntary management of spatial distribution of fishing effort and catch by the industry.

In the absence of measures to limit catches to estimated sustainable levels in the individual SMUs, legal minimum lengths, set at levels that provide protection to an adequate proportion of the spawning adults, become the most important management measure to prevent depletion of adult stocks in any particular area. These legal minimum lengths (currently 125 mm south of Wonboyn and 120 mm in other areas) provide an essential safety net to ensure that adequate spawning to maintain populations continues to occur in all areas.

Stock assessments and performance indicators

Formal stock assessments are not currently conducted for the NSW abalone resource. The last model-based estimate of adult abalone biomass above the then

[2] FRDC (2018) Blacklip Abalone. In: *Status of Australian Fish Stocks Reports*. https://www.fish.gov.au/reportstock?kw=blacklip+abalone&page=1&sort=LatestFirst

115 mm size limit was conducted in 2007, estimating a total adult biomass of 1,100 tonnes south of Jervis Bay. A fisheries independent dive survey of abundance and size-structure of abalone on key southern reefs was conducted in 2013, providing an assessment of the spatial distribution and densities of stocks on the southern reefs at that time. In the absence of formal stock assessments, key performance indicators are used to provide evidence on trends in stock status. Although the interim harvest strategy does not yet specify reference points for these indicators, trends in the indicators are used to infer whether the current TACC is resulting in decline of the stock, is sustainable, or could be increased, in a less formal 'indicator-response' management approach.

There are three main performance indicators that are regularly estimated and used to inform management advice for the abalone fishery. Two of these are derived from fisheries logbook data and the third is derived using data captured by automated dive loggers, now used by most divers:

- Standardised catch rates (kg caught per dive hour) by area and SMU are calculated from logbook catch and effort data, providing an index of relative abundance of retained (legal sized) abalone.
- Standardised average weights of harvested abalone by area and SMU are estimated from counts and bin weights of landed abalone, providing an index of the size being attained by mature adults in the population under current fishing pressure.
- Dive position data provided by dive loggers are used to generate estimates of area dived (as a proxy for suitable abalone habitat) and of density of legal sized abalone by area. Abalone densities are scaled up to area dived to generate estimates of overall biomass of legal sized abalone by area, which are then calibrated using the results of the 2013 survey to provide estimates of adult abalone density, biomass, and harvest rates in dived areas. These are compared to caches to estimate harvest fractions by area.

There are management concerns regarding reliability of each of these performance indicators, all of which may be positively biased. Catch rates of abalone are prone to hyper-stability, remaining high despite declines in the underlying stock, as a result of aggregation of abalone and efficient search and harvest practices of divers. Abalone aggregations are typically located and fished until catch rates start to decline, after which divers move to the next aggregation. Serial depletion of aggregations is masked by moving diving effort to maintain high catch rates, despite a decline in the overall stock. Divers are likely to concentrate fishing effort on areas of highest density to maximise catch rates and minimise dive-time related costs.

Average size of abalone is likely to be biased towards larger animals, partially by sequential increases in the legal minimum length over the history of the fishery, but also by active selection by divers of larger abalone to meet domestic market preferences. Over the last two years of market limitations and reduced prices, divers have reported selecting larger abalone to maximise prices.

There are also management concerns relating to using the density of abalone removed from the water to estimate the density of abalone left in the water, as is done using the dive logger data. Optimal site selection behaviour by divers and how this has changed over time, will have affected the estimation of dived area and of

suitable habitat. While the estimates of density and biomass produced have been calibrated against results of the last fisheries independent survey, this survey was done in 2013 and it becomes increasingly uncertain over time whether that calibration still provides reliable results for the current abalone populations.

Stock status

Updated results for the three primary performance indicators are available in the 2021 report *Assessment of abalone stocks in NSW*[3].

- After fluctuating over 2000 – 2009, standardised catch rates increased rapidly in all four SMUs from 2010 –2015, from about 20 kg/hr to between 35 kg/hr (SMU 1) and 60 kg/hr (SMU 4). Catch rates declined between 2015 – 2017 but increased again to near highest estimated values by 2021.
- After a period of stability over 2000 – 2008, standardised average weight of landed abalone has also increased, slowly but steadily, in all SMUs over 2009 – 2021. There are indications of an anomalous increase in mean abalone weight in 2021 in SMU 1, but trends in all other SMUs are consistent.
- Trends in the dive-logger-based estimates of legal sized abalone biomass by SMU are less consistent. Estimated biomass in the historically overfished, but currently least fished, SMU 1 shows no apparent trend and is highly variable over the past four years. Estimated biomass in the recently heavily fished SMU 2 apparently increased from 2010 – 2015 and then decreased again. Biomass in SMU 3, also recently heavily fished, appears to have increased to 2016, decreased to 2018 and then increased again recently. Biomass in SMU 4, which has recently been subject to increased fishing, appears to have shown a steady increasing trend since 2010.

It is likely that these performance indicators are positively biased, particularly over the past two years of market limitations and under-caught TACCs, which may have resulted in increased values of these performance indicators in 2020 and 2021. However, excluding 2020 and 2021, operational behaviour and resulting biases are likely to have remained relatively consistent over the past decade, so that the longer-term trends in catch rate and average abalone size do show a probable increase in these indicators.

Interpreting trends in estimated biomass by SMU is complicated by the apparent shift in fishing effort southwards, after SMU 1 was historically overfished in the 1980s and 1990s. SMU 1 does not show any clear signs of recovery, although this area has been recently lightly fished, so there is little data available for the area. Trends in SMU 2 and 3 have fluctuated, but are currently near recent high levels, at least indicating that estimates of abalone density, suitable habitat and biomass have not declined markedly. The increasing trend in SMU 4 is probably correlated with the increase in fishing effort, resulting in an increase in estimates of dived area and therefore of biomass.

Total biomass across all SMUs is currently estimated to be 1,165 tonnes and the current harvest fraction across all areas is estimated to be 8.6% of that estimated biomass. Harvest fractions tend to increase from north to south, from < 1% in SMU 1

[3] Abalone Council of NSW 2021. Assessment of abalone stocks in NSW. Draft submission to the TAC setting process for 2021-22, March 2021. 46 pp plus appendices.

to currently 13 – 19% in SMU 4. In response to increasing estimates of catch rate, the overall abalone TACC was increased from 75 tonnes in 2010 to 130 tonnes in 2015. However, there was then a sudden and substantial decrease in catch rates under the 130 tonne TACC from 2016 – 2018, coinciding with an increase in estimated harvest fractions to the highest levels since 2021, reaching 13 – 15% in SMU 3 and 21 – 32% in SMU 4. In response to these concerning performance indicators, the TACC was decreased to 100 tonnes in 2018, after which catch rate increased again to near historically highest levels by 2020. This indicates that the TACC of 130 tonnes was not sustainable, at least not under conditions prevailing at the time.

The current overall TACC of 100 tonne appears to be sustainable and, coupled with the undercatch in TACC in 2020 and 2021, continues to contribute to positive trends in the performance indicators. A TACC at this level should facilitate ongoing rebuilding of the stocks and higher catch rates. Although indicators show increasing trends, inherent biases and the elapsed time since the last independent estimates of population structure suggest that it would be prudent not to increase the TACC at this stage.

Recommendations

- In the absence of formal area-based catch limits, legal minimum lengths at current sizes are the most important measure preventing over-fishing of spawning adult abalone. These should be retained at current levels.
- Options should be explored for gathering information on current densities and size-frequency distributions of abalone underwater, including sub-legal sized abalone. This is important to updating the information gathered during the 2013 fishery independent survey on spatial stock distribution and densities, to ensure that scaled estimates of population density, biomass and harvest fraction by area are reliable. Data on abalone population size-frequency distribution could be cost-effectively collected through use of industry divers to gather random size-frequency data during a small number of dives each year in each area, as part of a scientifically designed, industry run survey program.

Economic considerations

Details of the economic characteristics of the abalone fishery, namely catch, price, gross value of production (GVP), quota transfers, reported share trading prices and management charges, are provided in the most recent *Management Report – NSW Abalone Fishery 2021*[4]. Information on productivity factors directly affecting the economic performance of the fishery, namely catch, effort and catch rate for the fishery overall and by fishing area and Spatial Management Unit (SMU), is provided in *Assessment of abalone stocks in NSW*[5].

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[4] McKinnon, F. 2021. Management Report – NSW Abalone Fishery 2021. Report to the TAF Committee for the determination of a total allowable catch for the 2020/21 fishing period. NSW Department of Primary Industries, Fisheries NSW, Coffs Harbour, 38 pp.

[5] Abalone Council of NSW 2021. Assessment of abalone stocks in NSW Submission to the TAC setting process for 2021-22. Report commission by NSW Department of Primary Industries with support from Abalone Association of NSW, March, 100 pp.

Demand and Prices

The 2020/21 fishing period has been characterised by two significant challenges: the aftermath of the bushfires in December 2019 and January 2020 which resulted in the loss of a processing facility and the difficult market conditions related to COVID-19 since March 2020.

Market closures and social restrictions in the main export destination countries (Japan, China, Korea, Singapore) have resulted in little or no export demand for product in both normal trading and peak demand periods. The Coronavirus "second wave" in Japan, Malaysia, Hong Kong and Vietnam has been particularly hard on exporters, occurring when markets appeared to be reopening. The domestic market depends heavily on international tourism, which has stopped and domestic restaurants which have been closed, or operating with capacity restrictions.

The impact on beach prices has been dramatic. The nominal price in 2018 was $40.10/kg ($41.30 in real terms). Data from the Sydney Fish Markets, representing less than 1 per cent of the 2019/20 catch, indicated an increase in price over the previous year. However, industry feedback suggested the average for 2019/20 was unlikely to be more than $35/kg and was currently (March 2021) in the range $24-26/kg.

Productivity

Observable changes in catch per unit effort (CPUE) will generally reflect changes in the cost of catching quota, where an increase in CPUE implies a lower cost per unit of catch. The following summarises recent trends in CPUE in each of the fishery's spatial management units, as reported in the stock assessment.

SMU 1: Catch rate peaked in 2013-17 at the highest on record (>40 kg/hour), declined in 2018 (30kg/h, in part due to low survey catch rates), but recovered to a new record in 2019-20 (~50 kg/h).

SMU 2: Catch rates reached a low in 2017-18 (~35 kg/h) but have recovered in the years since (42 kg/h in 2020 and 46 kg/h in 2020-21).

SMU 3: Catch rates peaked around 2014-16 (~50 kg/h), fell to a low in 2018 (<40 kg/h) before recovering in 2019 and 2020 (~50 to ~55 kg/h).

SMU 4: Catch rates peaked during 2013-15 (~65 kg/h), fell slightly in subsequent years (<60 kg/h in 2018) but have recovered in the past two years (~65 kg/h).

These steady or improving catch rate trends in each of the SMUs suggest a lower cost of fishing per unit of catch. In recent years, there has also been a reduction in number of active divers. The number fell from an average of 32 in the four years 2014-2017 to around 23 in the 2019 calendar year (McKinnon 2021). The reduction in the number of active divers is proportionally only slightly greater than the decline in the TACC over the same period indicating, at best, a marginally higher level of capacity utilisation. Nevertheless, this effect together with increasing catch rates, suggests a small improvement in the productivity of the fishery.

Profitability

Although representative price data has been scant since 2019, the implications of the reduction in demand on the revenues of fishers can still be approximated with indicative prices and actual (2019/20) and projected (2020/21) catch data.

GVP in 2018 was $4.04m in real terms (McKinnon 2021) marginally below the average of $4.10m across the previous seven years (2011/12 - 2017). A simple correlation analysis over this period indicates a strong negative relationship between price and quantity where an increase in price has been associated with a reduction in market supply (TACC) and vice versa. However, the impact of COVID-19 on the market has seen a fall in both price and market supply. Based on a 2019/20 catch of 84.33 tonnes and an estimated average price of around $35/kg, GVP was approximately $2.95m in that year. This represents a fall of more than 25 per cent compared with the 2018 calendar year.

Assuming the current price of $24-26/kg reflects the average for 2020/21 and the catch for the year is in the range of 50-60 tonnes, GVP in 2020/21 can be expected to fall somewhere between $1.2 m and $1.6 m. This would represent a reduction of between 60 and 70 per cent of the GVP recorded in 2018 (and the average over most of the past decade).

While price is severely depressed, improvements in productivity (particularly through increased catch rates) will have gone some way in reducing the cost of fishing. However, minor improvements in catch rates are overwhelmed by a combination of unused TACC and price reductions that have been in the order of 35 to 40 per cent in the current season. The fact that many operators have not been using their quota (owned or leased) is a clear indication that not even cash costs can be covered at current prices.

Quota transfer prices provide an indicator of the short-term economic performance of the fishery. While there is no reported trading price of quota, anecdotal evidence suggests that prices in the current season (2020/21) have been in the range of $13-$18/kg, approximately half the level ($30-$32/kg) of two years earlier (2018).

The value of abalone shares, which reflect expectations of longer-term fishery profitability, have been relatively stable in real terms, averaging between $9,000 and $10,000 per share (real terms) since 2013/14[6]. While prices have not been reported for the limited trades that have occurred over the past two years, offer prices substantially below the recent trading range (up to 30 per cent) have not been taken up. This suggests that the long-term view of the fishery is largely undiminished, despite the disruptions over the past 18 months related to bushfires and COVID-19.

Analysis

As noted in the previous determination report[7] there are no independent economic targets or performance indicators for the fishery. Unfortunately, no information is

[6] NSW DPI Abalone share transfer report.

[7] NSW Total Allowable Fishing Committee (2020) *Report and Determination 2020-21: Abalone Fishery*, 10 June.

available on the cost of fishing which would allow analysis of the economic position of the fishery. Data on the variable costs of fishing would, at least, enable the estimation of a gross margin for the active business units and the fishery as a whole. A fishery gross margin model (or similar partial models) can be an alternative or proxy to maximising fishery profit, as measured by maximum economic yield (MEY)[8]. A fishery gross margin can be calculated as total fishery income less total variable costs, where variable costs are proportionate to fishing effort.

From an economic perspective, small changes in the TACC are unlikely to affect the performance of the fishery. Based on the short-term outlook for both the domestic (overseas tourist dependent) and export markets, any increase in the TACC is unlikely to be harvested. Indeed, the industry was of the view that without a dramatic improvement in the market outlook, there was little likelihood that even an unchanged TACC of 100 tonnes would be caught in 2021/22.

Conversely, a reduction in the TACC would be unlikely to generate any sustainable economic benefits for the fishery. In some fisheries a reduction in supply may result in improved prices, however for the abalone fishery it is absence of demand rather than oversupply that is the main reason for the currently depressed prices. Reducing supply via a lower TACC would have no material effect on market price.

More importantly, there is no evidence to indicate that a reduction in the current TACC would result in a medium to long-term improvement in catch rates sufficient to offset the reduction in revenue from the reduced catch. Again, the absence of detailed data on fishing costs and earnings, on the relationship between size and price, and on the differences in the biological productivity across the fishery, means it is not possible to make a complete analysis of this type of scenario.

For the reasons outlined above, there is no compelling case that the economic position of the fishery would be improved from any change (increase or decrease) to the current TACC.

Fishery management considerations

Sustainability

The NSW Abalone Fishery is managed through a range of legislative instruments and a co-management arrangement between the NSW Government and Abalone Council of NSW. The legislative instruments specific to abalone are contained in the *Fisheries Management (Abalone Share Management Plan) Regulation 2000* (the Plan), *Fisheries Management (General) Regulation 2010*, and *Fisheries Management (Supporting Plan) Regulation 2006*.

The primary requirements to harvest abalone are a commercial fishing licence with an endorsement for abalone, that is granted only when a person has a minimum of 70 shares. Individual transferable quota (ITQ) is allocated in proportion to a person's

[8] MEY indicates the level of catch that provides the maximum net economic benefits or profits to society. MEY can be estimated using complex bio-economic models with key parameters including biological carrying capacity (biomass at no fishing), biomass growth rate, fishing mortality rate, revenue and costs.

shareholding. The TAFC determines the total allowable commercial catch (TACC) for each fishing year which provides the weight value as kg per share. The TACC/ITQ system is functioning well with the TACC always near fully caught (pre COVID) demonstrating that it is constraining catch and that ITQ is near fully utilised. There are also good levels of quota trading (30-60% leased in or out each year). Other fishery controls are a minimum legal length, a maximum quota holding, controls on fishing gear and areas closed to fishing (including marine protected areas).

While there is no formal abalone harvest strategy at this time, management measures have been put in place over the last several years that aim to rebuild the fishery. Two performance indicators can be used to ascertain whether the commercial harvest is sustainable or not: average catch rate for the whole fishery of > 40kg/hr (currently around 50k/hr) and the harvested fraction of the legal sized stock being < 10% for the whole fishery (currently around 8.5%). It should be noted that these indicators are empirically derived, not theoretically based.

Both the legal minimum lengths (120mm, except 125mm south of Womboyn) and the TACC (100 tonnes) provide additional stock protection should one or both performance indicators be breached, or not have the desired effect of protecting the stock. Again, the 100 tonnes is empirically derived with somewhat higher TACCs (e.g., 130 tonnes or more) having caused historic catch rate declines. However, one matter that the management settings do not address is the risk of localised stock depletion, as using state-wide averages for the two performance indicators does not monitor this risk.

The general view from abalone industry participants at the TAFC stakeholder meeting held in Merimbula on 22 March 2021 was that the current regulatory scheme was working effectively to rebuild the stock, as demonstrated by improving catch rates and the overall harvest fraction of legal sized abalone being under 10%. The industry was of the view that SMU catch limits were not practical when the fishery could be locally variable (in terms of stock availability and size) from year to year and divers needed spatial flexibility to efficiently harvest the quota due to weather and market conditions.

Fishing sectors

Abalone is also caught by other fishing sectors and is subject to significant illegal fishing, as reported by DPI Fisheries Compliance. While the legal recreational catch is no more than 10 tonnes p.a. (with a possession limit of two per person) and the permitted Aboriginal catch less than 1 tonne p.a., there is an estimated illegal catch of around 20 tonnes p.a. These catches are assumed to be relatively constant over time and do not directly affect the measurement of the two commercial stock indicators (commercial catch rate and commercial harvest fraction). However, they do have an impact on the rebuilding of the stock and need to be considered in any future harvest strategy as part of measuring total fishing mortality.

Illegal, Unreported and Unregulated (IUU) abalone catch is a serious issue, because as well as depleting the abalone stock, it often involves organised crime and can have links to other illegal activities. DPI Fisheries Compliance understands this and

is working closely with other enforcement agencies to both deter and prosecute offenders, many of whom are recidivists. Prosecution is often a protracted and resource intensive process. The TAFC recommends that consideration be given to scaling fines from the current flat $500 to up to $10,000 commensurate with the value of the abalone that is stolen. This would be a greater and more immediate deterrent to reoffending. Abalone special penalties in other jurisdictions can provide guidance in this respect.

There is also a growing number of non-English speaking people becoming involved in abalone harvesting and some are fishing illegally often using scuba and small vessels making detection more difficult. Culturally appropriate education through social media channels and increased use of technology by NSW DPI Fisheries Compliance should be considered to reduce this IUU risk.

Further information about compliance in the NSW Abalone Fishery can be found in *'Compliance Report – Abalone, Prepared for the Total Allowable Fishing Committee process for determination for the Total Allowable Commercial Catch of NSW Abalone for the 2021/22 season'. NSW DPI, March 2021.*

Another management issue that should be addressed is the different abalone legal minimum length between the recreational (117mm) and commercial (120mm) sectors. There is no scientific or economic reason for this difference and the TAFC supports the Department in its consultation with the Recreational Fishing Alliance to work towards raising the recreational size limit to 120mm, which will support stock rebuilding and improve fishery compliance.

The issue of Aboriginal harvest of abalone remains unresolved. DPI Fisheries Compliance advice is that there are around 40 current legal matters involving Aboriginal harvesting, which require significant government legal resources to manage. Furthermore, most abalone seized are undersized and sold well under the market value. This is a loss to the resource and the NSW economy. Aboriginal people began harvesting abalone prior to European settlement and yet have no formal share of the NSW fishery. While the size of the historical Aboriginal harvest is not known, opportunities to formally recognise an Aboriginal share of the fishery need to continue to be explored. This has occurred in other Australian jurisdictions (including the Torres Strait) and in New Zealand, which can provide guidance in pursuing this policy issue.

Market Impacts

The 2019/20 bushfires followed by COVID-19 in 2020/21 have had a significant impact on the commercial abalone market, both in terms of market demand (domestic and international) and logistics. Industry members advice at the Merimbula meeting was that they did not expect to see much improvement in markets in the next 6 – 12 months and were working with other fishing industry groups to form new supply chains and sales points. The NSW Government has put a range of measures in place to support the fishing industry (including abalone) from fee relief to grants, which should assist these initiatives.

While some shareholders supported carryover of uncaught catch from 2019/20 to 2020/21, no such request was made at the Merimbula industry meeting for 2020/21 to 2021/22. Several shareholders have previously said that they would rather the quota was left in the water to grow and reproduce than be caught and sold for little or no profit.

Management Summary

The TAFC is aware of its obligation to pursue the best outcome for the state of NSW when determining a TACC and in doing so weigh up ecological, economic and social considerations. With the consensus of science, industry and management that the current abalone fishery arrangements are supporting stock rebuilding, there is no reason to make major adjustments to them, including the TACC of 100 tonnes. This is especially so when the short-term market for abalone is expected to remain depressed.

Notwithstanding the above, abalone management can still be improved through raising the recreational size limit to the commercial size limit, improving compliance responses to be more immediate and commensurate with detected offences and planning for a future with Aboriginal catch shares, within the current shareholdings. However, it is the absence of a formal harvest strategy that sets out reference points, control rules and management responses that is the most important matter to address. This would provide greater certainty for all stakeholders about acceptable biological and economic risks to the stock and fishery, including the circumstances under which the TACC will rise or fall, and what the management responses would be if the risks become unacceptable.

Recommendations

- The TAFC determines that the TACC for NSW Abalone be set at 100 tonnes for the 2021-22 fishing period.
- The TAFC recommends that the abalone industry and Department commence the development of a NSW Abalone Fishery Harvest Strategy with the aim of implementing it from 1 July 2023.

Determination

The Total Allowable Fishing Committee (TAFC), pursuant to Part 2A of the *Fisheries Management Act 1994*, determines that the total allowable commercial catch of Abalone should be controlled and allocated through the following measure:

1. A TACC of 100 tonnes during the fishing period 1 July 2021 to 30 June 2022.

Species	Catch Limit 2021/22 (tonnes)
Abalone (*Haliotis rubra*)	100

Signed (for and on behalf of the TAFC)

William Zacharin
Chair, TAFC

15 April 2021