

# **NSW TOTAL ALLOWABLE FISHING COMMITTEE**

## **ABALONE FISHERY**

### **DETERMINATION FOR THE 2022/23 FISHING PERIOD**

11 April 2022

## 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 shareholding or 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. Currently, there is no formal harvest strategy for this fishery.

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 the Abalone Fishery for the period 1 July 2022 to 30 June 2023.

### 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 T AFC recommends that the Abalone Industry and NSW DPI complete the development of a NSW Abalone Fishery Harvest Strategy with the aim of implementing it no later than 1 July 2023.
2. The committee notes the high reliance on fishery-dependent data to inform the primary and secondary indicators of stock status. The committee recommends that NSW DPI and the commercial industry address the potential for bias in fishery-dependent data by applying an independently designed and statistically structured data collection and monitoring program as a regular validation tool.
3. The committee recommends an independent review of the stock assessment be conducted to be consistent with best practice.
4. NSW DPI seeks advice from abalone processors and/or fishers on abalone prices for input into management reports and not rely on Sydney Fish Market prices for abalone.

## 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 2022 to 30 June 2023.

## 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 44 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

<b>Spatial Management Unit</b>	<b>Fishing areas</b>
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<sup>1</sup>. The TAFC met with fishery scientists, fishery managers and participants in the Abalone Fishery in Merimbula, NSW on 29 March 2022 to discuss the current fishery

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<sup>1</sup> Abalone Council of NSW (2022) Assessment of Abalone stocks in NSW: Submission to the TAC setting process for 2022/23, Sydney

assessment and economic conditions in the fishery. Shareholders, divers and abalone processors reported that the impact of the 2019/20 bushfires, recent storm events and COVID-19 market disruptions continue to significantly affect the operation of the fishery. There has been an undercatch of the TACC in the past two fishing periods due to these events. As of 29 March 2022, there was approximately 60 t of the TACC remaining to be caught, meaning a third fishing period of undercatch is likely.

## Biological considerations

### ***Biology and stock structure***

The NSW abalone fishery harvests Blacklip Abalone (*Haliotis rubra*). Spawning larvae are dispersed by ocean and tidal currents for one week after spawning and once settled, are highly resident, forming aggregations on suitable reef habitat, often in substantial localised densities. Aggregations typically are genetically indistinguishable from one another and do not constitute separate biological stocks. The species grows and matures slowly, reaching a maximum age of between 20 and 50 years. Aggregations therefore can be rapidly fished down and are susceptible to serial, localised depletion.

Abalone throughout the world risk localised depletion and are often spatially managed. In the absence of measures to spatially limit catches in NSW, legal minimum lengths are used to protect spawning adults and prevent over-fishing and localised depletion. Legal minimum lengths thus provide an essential safety net to ensure that spawning is maintained in local aggregations.

### ***Stock assessments and performance indicators***

Formal stock assessments that estimate abalone stock status are not currently conducted in NSW. The last model-based estimate of adult abalone biomass above the then 115 mm size limit was conducted in 2007, estimating a total adult biomass of 1,100 tonnes south of Jervis Bay. A fishery 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. All indicators rely on fishery dependent data.

There are three main performance indicators used to inform management advice. 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:

1. Standardised catch rates (kg caught per dive hour) by area and Spatial Management Units (SMU) are calculated from logbook catch and effort data, providing an index of relative abundance of retained (legal sized) abalone.
2. 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.

3. 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 catches to estimate harvest fractions by area.

Abalone are susceptible to hyperstable catch rates, which occur when catch rates remain constant, while the actual population declines. They are often associated with aggregating behaviour and create an illusion that population levels are stable, when they are not, thus potentially masking fishery declines. This has important implications. First, it means fishery-dependent data usually will not detect the changes in abundance, or density in areas beyond where the fishery is operating. Second, it also means that the abundance seen by the fishery (and divers) is not indicative of the broader stock abundance, setting up potential tension and disagreement between scientists, managers and stakeholders.

An assessment based on fishery dependent data is also confounded by changes in size limits. Catch rates are assumed to represent the biomass available to the fishery, which by definition change with changes to the size limits. Average size of abalone is also 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.

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***

The TAFC view the assessment report as a reflection of the stock status in the currently fished SMUs. Effort across SMUs was not provided, but could be inferred from catch rates. It is understood low amounts of effort are being experienced in SMU 1. Anecdotally, the committee heard that there are great numbers of undersized fish in SMU 1 and high catch rates have been reported in SMUs 3 and 4.

The assessment report showed that after fluctuating between 2000 and 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. In 2020, catch rates were exceptionally high in SMU 1, but declined thereafter, despite very low catches. Catch rates in the other SMUs since 2017 have been more stable at around 2015 levels.

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.

Trends in the logger-based estimates of legal sized abalone density by SMU are less consistent. SMU 1 is highly variable over the past four years and in decline. Estimated densities in SMU 2 reflect the pattern in the catch rates of an apparent increase from 2010 – 2015 and decrease since. SMU 3 and SMU 4 seem to be stable but variable. Diver behaviour, TACC changes and possible climate effects represent confounding factors and unaccounted risks in stock status.

SMU 1 shows signs of continued decline, even under light exploitation. This also means that there is little data available from the area to make a confident assessment. Trends in SMU 2, 3 and 4 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.

In 2021/22, harvest fraction is expected to be between 14% in SMU 3 and 20% in SMU 4, with 3 of the 4 SMUs (SMU 1, 2 and 4) having harvest fractions higher than the suggested limit of 15%.

The current TACC of 100 tonnes is not likely to threaten the stock in the short term, but uncertainties due to biased indicators and climate remain and represent a persistent risk. The proposal to provide target catches at a fine spatial resolution is regarded as a promising means to prevent localised depletion.

### **Recommendations**

- The committee notes the high reliance on fishery-dependent data to inform the primary and secondary indicators of stock status. The committee recommends that NSW DPI and the commercial industry address the potential for bias in fishery-dependent data by applying an independently designed and statistically structured data collection and monitoring program as a regular validation tool.
- The committee recommends an independent review of the stock assessment be conducted to be consistent with best practice.

### **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 2022*. 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 the report *Assessment of Abalone Stocks in NSW*.

McKinnon (2022)<sup>2</sup> reports a beach price of \$48.14 for the 2020/21 fishing season, based on a price estimate from Sydney Fish Market (SFM). Given the low volume of

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<sup>2</sup> Management Report NSW Abalone Fishery: Report to the TAF Committee for the determination of a total allowable catch for the 2022/23 fishing period

abalone sold through SFM, the price is not representative of the fishery and this is acknowledged by McKinnon (2022). The industry members at the TAFC meeting in Merimbula confirmed that the beach price was substantially less (\$26-\$28 per kilo). The impacts of IUU catch of abalone caught in NSW and marketed domestically on the market price is unknown.

Throughout the 2020/21 fishing season, demand and price for abalone remained low due to restrictions associated with managing COVID-19 both international and domestically. International seafood markets were also impacted by trade relationships between Australia and China. Impacts on seafood processing infrastructure from bushfires remained. While price is severely depressed, improvements in productivity (particularly through increased catch rates) will have gone some way in reducing the cost of fishing.

Share transactions for both the 2019/20 and 2020/21 seasons and the completed part of this season remain low in frequency and volume. It is not compulsory for prices to be recorded or recorded accurately in share transfer application documents. There were five share transactions reported of which four recorded price information:

- 20 shares at \$10,000 per share in 2019/20
- 80 shares at \$7,500 per share in 2020/21
- 20 shares in two transfers at \$12,000 per share in 2021/22

The low number and volume of share trades, together with incomplete data on share trades does not make it possible to robustly determine recent trends in share price. The lack of compulsory recording of prices associated with share prices and the validation of any prices provided is an area where economic data collection can be improved with limited or no additional management cost.

During 2020/21 fishing season, quota transfer as a percentage of the quota was historically high at 62%, however in the current fishing season to date it has reverted to 33% which approximates the long-term average. The historical high in the 2020/21 season is probably a result of disruptions associated with COVID-19 and trade rather than a permanent change to the supply, demand and distribution of quota and quota use. While there is no reported trading price of quota, anecdotal evidence suggests that prices in the 2020/21 have been in the range of \$13- \$18/kg, approximately half the level (\$30-\$32/kg) of two years earlier (2018). This is not unexpected given the market circumstances.

### ***Considerations for Current TACC setting***

Industry members expressed some cautious optimism for increased demand for abalone in the 2022/23 fishing season, as restrictions related to COVID-19 become less prevalent and onerous. However, significant improvements are more likely in the latter part of the season, as key international markets are still currently impacted by restrictions associated with COVID-19. Furthermore, seafood trade relationships between China and Australia remain uncertain. Overall, demand limitation is likely to continue to be more important than supply limitation in driving economic



performance in the fishery in 2022/23. Industry suggested the beach price for abalone in 2022/23 will be in the vicinity of \$26 to \$28 per kg.

Fuel prices are likely to remain high to very high in 2022/23, which may influence some decisions regarding the pattern of fishing behaviour. From an economic perspective, small changes in the TACC are unlikely to affect the performance of the fishery, given the continued limitations on product demand. Overall, there is no reason to adjust the TACC.

### **Recommendation**

- NSW DPI seek advice from abalone processors and/or fishers on abalone prices for input into management reports and not rely on Sydney Fish Market prices for abalone.

## 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 are the *Fisheries Management (Abalone Share Management Plan) Regulation 2000* (the Plan), *Fisheries Management (General) Regulation 2010*, and *Fisheries Management (Supporting Plan) Regulation 2006*. Furthermore, a commercial fishing licence with an endorsement for abalone that is granted only when a person has a minimum of 70 shares is required to commercially fish in the fishery.

A total allowable commercial catch (TACC) is applied to the fishery under which individual transferable quota (ITQ) is allocated in proportion to a person's shareholding. The TACC determines the TACC for each fishing year that provides a weight value in kg per share. Other fishery controls are a minimum legal size, a maximum quota holding, controls on fishing gear and areas closed to fishing (including marine protected areas). The TACC has historically (pre-bushfires and COVID-19) been fully caught.

Over the last decade management measures have been put in place to rebuild the fishery. The current stock assessment suggests that legal sized fishery biomass has been stable at around 1,000 tonnes from 2014/15 to 2020/21 with an increasing average harvested size over the same period. Two indicators are used to ascertain whether the commercial harvest is sustainable: average catch rate for the whole fishery of > 40kg/hr and the harvested fraction of the legal sized stock being < 10% for the whole fishery.

Both the minimum size limits (generally 120 mm but 125 mm south of Womboyn) and TACC (100 tonnes) provide additional stock protection should one or both indicators be breached or not have the desired effect of protecting the stock. However, one matter that the management settings do not address is the risk of localised stock depletion as state-wide indicators are used. Furthermore, there is no recruitment index for this fishery, which can affect the interpretation of other fishery indicators, such as increasing average harvest size.

The fishery is divided into four spatial management units (SMUs) with almost all the catch coming from the southern half of SMU 2 and SMUs 3 & 4. Geographically these are Tathra to Eden, Eden to Womboyn and Womboyn to Cape Howe, respectively. Most recent catch rates (2021/22) are above 40 kg/hr (the target level) in SMUs 2, 3 & 4. The catch rate in SMU 1 is about half that at just over 20 kg/hr. There has been a strong trend of declining catch from Bermagui northward over the past 20 years, that is, SMU 1 and the northern half of SMU 2 with catch concentrated in SMUs 3 & 4. Reasons for this may include changes in fishery management, industry harvesting strategies and climate effects.

The data for the first nine months of 2021/22 need to be treated with caution given the effects of the carry forward of uncaught quota from 2019/20 and 2020/21, which impacted most of the fishery indicators. However, they do show declines in legal sized biomass, which should be closely monitored.

Abalone industry participants at the T AFC stakeholder meeting held in Merimbula on 29 March 2022 expressed the view that biologically the stock was performing well and management measures were effective with their main concerns about the abalone market. The lingering effects of COVID, trade tensions, supply chain bottlenecks, recent storms and war in Ukraine were all contributing to an unstable market.

### ***Fishing sectors***

In addition to the commercial sector, abalone is caught by recreational fishers with the catch estimated at no more than 10 t p.a (with a possession limit of two per person) and the permitted Aboriginal catch estimated at less than 1 t p.a. There is, in addition, an estimated illegal catch of 20 t p.a. These catches are assumed to be relatively constant over time and need to be incorporated in any future harvest strategy as part of measuring total fishing mortality.

IUU abalone catch is a serious issue involving organised crime. NSW Fisheries Compliance continues to deter and prosecute offenders. Prosecutions are costly and the T AFC has recommended that consideration be given to substantially raising fines from the current \$500 to \$10,000 which is more commensurate with the value of the abalone that is stolen and will be a greater, immediate deterrent to reoffending. DPI's progress against this recommendation is provided further on in this section.

There remain differences in abalone size limits between the recreational (117mm) and commercial (120mm) sectors. The T AFC supports the Department's efforts to resolve this in consultation with the Recreational Fishing Alliance to support stock rebuilding and improve fishery compliance.

The Aboriginal harvest of abalone remains to be resolved and the courts are the primary means through which arguments about it are made. Resolving what is largely a resource ownership issue through compliance actions is unlikely to be successful and an alternative pathway needs to be found. The Northern Territory, Tasmania and Torres Strait Fisheries (Cwlth) have made progress over the last few

years in recognising indigenous commercial harvesting rights that NSW could consider and tailor to its own circumstances.

### **Market Impacts**

The 2019-20 bushfires followed by COVID 19 in 2020 and 2021 have had a significant impact on the commercial abalone market both in terms of market demand (domestic and international) and logistics. Whether this continues in 2022 is not yet known, as while Australia has lifted most COVID restrictions, issues with supply chain logistics remain. In most years the harvest is almost 100% of the nominal TACC, but in 2019/20 it declined to around 83% and in 2020/21 was around 94%.

Carryover of uncaught quota was allowed from 2019/20 to 2020/21 (15.664 t) and from 2020/21 to 2021/22 (21.54 tonnes – aka ‘abalone extension quota’) in response to NSW government COVID restrictions. While this meant that from 2019/20 to 2021/22 the effective TACC was not 100 t per fishing year, the combined total TACC for those three years was 300 t. The current catch against TACC (including 21.54 t of extension quota) for 2021/22 is around 56 t to late March 2022.

Industry members advice at the Merimbula meeting was that their expectation for the 2021/22 fishing season is that around 100 t of abalone will be harvested leaving around 20 t uncaught. They did not see a need for further quota carryover.

### **Departmental responses regarding progress against T AFC recommendations made in 2021**

1. *The T AFC recommends that the Abalone Industry and NSW DPI complete the development of a NSW Abalone Fishery Harvest Strategy with the aim of implementing it no later than 1 July 2023.*

Refer to Section 7.2 Harvest Strategies.

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.*

The LML remains at 120 mm in waters north of Wonboyn and 125 mm in waters south of Wonboyn.

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.*

No progress.

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.*

No progress.

#### ***T AFC comment against progress***

Regarding Recommendation 1, the T AFC again encourages DPI to complete the abalone harvest strategy expeditiously to provide greater certainty for the T AFC and industry about how the fishery is to be managed. The T AFC notes the positive response to Recommendation 2. Regarding the lack of progress against Recommendation 3, the T AFC reaffirms the importance of this recommendation (as modified in this determination) given the urgent need for an independent survey to verify and support the fishery dependent indicators used to assess fishery status. The last independent fishery survey was undertaken nine years ago (2013). While the T AFC understands Recommendation 4 may take some time to implement, without it there is little deterrence for continued commercial scale abalone theft. The committee noted that the government was preparing a Right to Fish Bill for parliamentary consideration, which included increases to fines.

#### ***Management summary***

Current fishery management arrangements have helped stabilise the fishery after a period of overfishing. Fishery indicators are mixed in terms of stock status but overall support maintaining a 100 tonne T ACC for the 2022/23 season. However, it has been nine years since the last fishery independent survey to verify the fishery dependent data and indicators the stock assessment is based on. Given the time elapsed, the risk to the stock continues to grow and unless it is addressed in the near term there are implications for future T ACC setting.

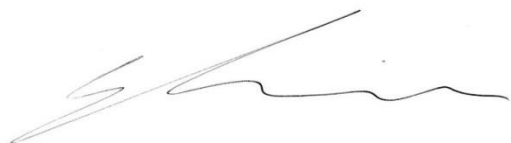
## Determination

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 2022 to 30 June 2023.

Species	Catch Limit 2022/23 (tonnes)
Abalone ( <i>Haliotis rubra</i> )	100

Signed (for and on behalf of the TAFC)



William Zacharin  
**Chair, TAFC**

11 April 2022