

NSW TOTAL ALLOWABLE FISHING COMMITTEE

ESTUARY GENERAL FISHERY - HAND GATHERING SECTOR

- Pipis
- Cockles
- Ghost Nippers
- Beachworms

DETERMINATION FOR THE 2022/23 FISHING PERIOD

19 April 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 Estuary General Fishery - Hand Gathering (EGF-HG) for the period 1 July 2022 to 30 June 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. NSW DPI takes immediate steps to ensure the commercial sector completes its logbooks and that improvements are made to estimates of non-commercial harvest, with these actions supported by effective education and compliance programs, so that robust stock assessments can be undertaken in future years.

Determination

The Total Allowable Fishing Committee, pursuant to Part 2A of the *Fisheries Management Act 1994*, determines that the commercial catch of species in the Estuary General Fishery - Hand Gathering, during the fishing period 1 July 2022 to 30 June 2023, should be controlled and allocated through the following measures:

1. A TACC of **156 tonnes** for Pipis
2. A TACC of **45 tonnes** for Cockles
3. A TACC of **5.6 tonnes** for Ghost nippers
4. A TACC of **8.5 tonnes** for Beachworms

Introduction

The Estuary General Fishery - Hand Gathering (EGF-HG) is a multi-species, share managed fishery, spatially structured into seven regions (Appendix 1). Commercial fishing businesses require an endorsement related to each region and a minimum shareholding related to each species to harvest or nominate an authorised fisher to harvest the species groups in the fishery. The four species groups are: Pipsis (*Donax deltoides*), Estuary Cockles (*Anadara trapezia*), Ghost Nipper (*Trypaea australiensis*) and Beachworms (3 species of *Onuphidae*). Approximately 76 estuaries and over 100 beaches are accessed across all seven regions by the EGF-HG.

The TAFC met with a number of shareholders in the EGF-HG in Coffs Harbour on 31 March 2022 to discuss fishery biology, catch and associated management issues. Written submissions by shareholders on the stock status of the fishery and other fishery management issues were provided to the Committee by the NSW Department of Primary Industries. Current stock assessment reports on Pipsis¹, Cockles², Ghost Nippers³ and Beachworms⁴ were also provided to the Committee by the Department.

Biological considerations

Pipsis

Stock structure

Pipsis (*Donax deltoides*) are a burrowing bivalve, considered to form a single genetic stock consisting of local populations found on dissipative beaches in eastern and southern Australia. Recruits are likely to come from the beach on which they settle or from nearby beaches. Individual beaches may therefore be subject to short-term localised depletion if heavily exploited, but can be re-populated over time, provided there are healthy adult populations on nearby beaches.

Catches

Annual commercial Pippi catches increased from 80 tonnes in 1988 to around 200 tonnes per year over 1989-1995, before increasing rapidly to a peak of 670 tonnes in 2000. Catches then declined to a historical low of 9 tonnes in 2010. Catches over this period were primarily used for bait. From 2010 onwards, the fishery transitioned to provide product for human consumption in the restaurant trade, with catches

¹ Johnson, D.D. 2022. Stock assessment report 2021/22 – Estuary General Hand Gathering Fishery – Pippi (*Donax deltoides*). NSW Department of Primary Industries. Fisheries NSW, Port Stephens Fisheries Institute: 72 pp.

² Chick, R.C. 2022. Stock assessment report 2021/22 – Estuary General Fishery (Hand Gathering) – Estuary Cockle (*Anadara trapezia*). NSW Department of Primary Industries. Fisheries NSW, Port Stephens Fisheries Institute. 49 pp.

³ Chick, R.C. 2022. Stock assessment report 2021/22 – Estuary General Fishery (Hand Gathering) – Ghost Nipper (*Trypaea australiensis*). NSW Department of Primary Industries. Fisheries NSW, Port Stephens Fisheries Institute. 49 pp.

⁴ Chick, R.C., Barnes, T. C. and Fowler, A. M. 2021/2. Stock assessment report 2020/21 – Estuary General Fishery (Hand Gathering) – Beachworms (*Onuphidae*). NSW Department of Primary Industries. Fisheries NSW, Port Stephens Fisheries Institute. 61 pp.

increasing to around 150 t per year from 2015 onwards. The TACC last year was 156 t.

Stock assessment

The NSW Pipi stock has been assessed using catch rates, depletion models, length-based spawning potential ratio and two catch-only methods (OCOM and Catch-MSY).

The main indicator of the stock is catch rate (catch per unit effort – CPUE), which provides an index of abundance of the harvested portion of the resource. Over the period 1990-2010, CPUE declined from a historical maximum of 218 kg/day in 1990 to a low of 17 kg/day in 2010. The combined decline of total catches and CPUE over this period indicated over-fishing and depletion of the NSW Pipi resource, at least on the harvested beaches.

Several management measures were implemented in response to this depletion, including spatial closures of some beach areas; a six-month temporal closure over the spawning season; a 45 mm legal minimum length to allow spawning to occur at least once before harvesting and a daily catch limit of 40 kg per fisher. These measures are credited with a reduction in fishing pressure and a rebuilding of the stock in the currently fished areas. They also mean that CPUE cannot be easily compared before and after the management intervention. Current stock status therefore focuses on trends since 2010.

Coinciding with the increase in catch since 2010, nominal commercial CPUE increased from 5 kg/hr in 2010 to 16 kg/hr in 2019. A linear trend through nominal CPUE increased by 194% over 2009-2019, and a linear trend through standardised commercial CPUE increased by 135% over the same period. The CPUE trend in Region 1 has declined, while the trend in Region 3 and Region 4 has increased since 2009.

Catch and effort data from 2009-2018 and 2018-2020 are used in within-season depletion models to estimate exploitation rates. Exploitation rates in two of the regions (Region 1 and Region 4) were between 24% - 29%. In Region 3 they were between 28% - 73%.

Catch data are also used in low information Catch-MSY and Optimized Catch-Only Models (OCOM) indicate that the stock had been depleted to about 10% of pre-exploitation levels by 2007, but has since recovered. At a constant catch level of around 150 tonnes, the stock is projected to increase steadily towards 48% B_0 (a commonly used target reference level).

Length data are used to calculate length-based spawning protentional ratio using data to 2019. Estimates of relative fishing pressure (F/M) were high (3.7 – 4.1), but spawning potential (SPR), the proportion of the unfished reproductive potential is between 0.43 – 0.45.

Stock status

The NSW Pipi resource appears to have been depleted over the period 1990-2005, when annual catches averaged about 370 tonnes. Since 2010, reductions in fishing

pressure have resulted in a rebuilding of the stock to about 33% of the pre-exploitation level, with increases in catches and CPUE. The stock is projected to continue rebuilding towards the target reference point at catch levels below 170 tonnes.

Cockles

Stock structure

The structure of Estuary Cockle (*Anadara trapezia*) is poorly understood in NSW, with genetically distinct populations apparently co-occurring across many estuaries. It is not clear how genetically distinct populations could be separately managed, given that they occupy the same habitat in estuaries. Cockles are therefore managed as a single management unit.

Catches

Total reported Cockle catches increased from 5 t in 1988/89 to a historical peak of 93 t in 1991/92. The fishery has shown three periods of activity with average annual catch averaging 82 t per year over 1990/91 – 1993/94, 43 t per year over 1994/95 – 2001/02 and 25 t per year over 2002/03 – 2011/12. Catches then increased rapidly again to a recent peak of 79 t in 2014/15 and averaged 65 t per year over 2014/15 – 2018/19. The current TACC of 45 t was raised last year to harmonise the reference periods 2009/10 – 2016/17 over which initial TACC calculations across species were based.

Stock assessment

The NSW Cockle stock has been assessed using catch rates. There are a number of concerns with the available data used to estimate status. Of most concern, reporting of commercial catch and effort data in logbooks is incomplete and has been particularly poor in recent years. About 40% of catches of the allocated and reportedly used 45 t TAC were not reported in 2019/20. The way that fishing effort has been reported has also changed frequently over the years, historically reported in days fished estimated in different ways over different periods and now reported in hours fished, but only by some fishers. Indicators calculated using the available commercial catch and effort data are therefore subject to substantial uncertainty and bias, in addition to being difficult to compare over time. Longer-term trends in important indicators like catch rate per unit of effort (CPUE) are particularly difficult to calculate and interpret.

Nonetheless, catches have recently increased to levels similar to the historically high catches in the early 1990s. Since 2011/12, this catch increase has been associated with increasing CPUE, particularly catch per fisher day, which increased by about 45% over 2011/12 – 2019/20. At an individual estuary level, CPUE has increased to above long-term average levels in Wallis Lake, Pambula Lake, Shoalhaven/Crookhaven River. In Lake Illawara and Merimbula Lake, CPUE is below long-term average levels, but fairly stable.

Stock status

As a result of the uncertainty in key indicators like CPUE, the stock status of Cockles in terms of biomass and fishing mortality rate is currently reported as 'Undefined' in the Status of Australian Fish Stocks reports, in terms of both depletion (biomass

compared to the pre-exploitation level) and fishing mortality rate. However, coincident increasing catches and catch rates indicate that the resource is able to sustain recent catch levels and appears to be increasing. Every effort must be made to ensure that all commercial cockle fishing catch and effort data are completely and accurately reported in commercial fishing logbooks, with accurate documentation of fishing method, fine-scale fishing area, fishing effort in actual hours fished and catch per fishing operation. If logbooks are not improved to become a reliable source of fisheries data, then the feasibility of initiating a programme of fishery independent cockle density and abundance surveys should be evaluated and costed. Results of such surveys in heavily exploited zones could be used to implement a spatial (estuary-based) approach to management of cockles, such as using spatial closures to allow recovery of overfished areas.

Recommendation

- NSW DPI takes immediate steps to ensure the commercial sector completes its logbooks and that improvements are made to estimates of non-commercial harvest, with these actions supported by effective education and compliance programs, so that robust stock assessments can be undertaken in future years.

Ghost Nippers

Stock structure

Ghost Nipper (*Trypaea australiensis*) form a large component of the invertebrate fauna inhabiting low energy intertidal beaches and mudflats along the eastern and southern coast of Australia and are common in many NSW estuaries. There are no published studies on the genetic stock structure of Ghost Nipper and they are assumed for management purposes to constitute a single stock in NSW. However, the combination of brooding females and slow water movement along the estuarine beaches they inhabit suggest that recruitment in estuaries comes from adult populations in those same estuaries, so that populations within estuaries could constitute functionally separate biological stocks. This suggests that exploitation rates should be kept to moderate levels in all areas to reduce the risk of depletion in any one estuary.

Catches

The total reported commercial catch of Ghost Nippers increased steadily from 1-2 tonnes in the early 1990s to around 4.5 tonnes in 2019/20. Catches fluctuated between 2 and 4 t over 1995/96 – 2008/09 and have averaged 4.1 t per year since 2009/10. Over the past decade, > 90% of this catch has been made in the Port Hacking area, supplying the Sydney recreational bait market. There is substantial recreational harvesting of Ghost Nippers for bait in estuaries north and south of Sydney, with estimates from surveys indicating a decline in recreational catches from about 7.5 t in 2000/01 to about 2 t in 2017/18.

Stock assessment

Commercial nominal CPUE in kg/fisher day has increased slightly since 2009/10. CPUE (in kg/hr) has fluctuated, but appears to have increased more substantially, with a linear trend increasing by 42% over 2009/10 – 2019/20. These CPUE trends

primarily reflect the status of the most heavily exploited Port Hacking area. Standardised CPUE for the Port Hacking area has been stable above the 10-year average since 2015/16 and surveys indicate that harvest rates in this most heavily fished area are probably less than 10% of the resource in this area. Other estuaries north and south of Sydney are comparatively lightly exploited by recreational fishers mainly during holiday seasons, but lack of data in these areas means a measure of stock status in them is not available.

Stock status

Based on the above indicators, the NSW Ghost Nipper resource is classified as Sustainable. There are no indications of historical depletion in the catch series and CPUE indicators all appear to be increasing or stable above the 10-year average. This indicates that current commercial catches are sustainable.

Beachworms

Stock structure

Beachworms in NSW refers to three species of polychaete worms (*Onuphidae*) harvested from the intertidal zone of beaches for use as bait. The stumpy or kingworm (*Australonuphis teres*) makes up the bulk of the catch, with smaller quantities of slimy (*A. parateres*) and wiry (*Hirsutonuphis mariahirsuta*) worms. Assessment results presented here are therefore derived primarily from data for the stumpy worm.

There is evidence of multiple genetic groups of stumpy worms along the NSW coast, but with no clear geographic distribution patterns and high genetic flow between them. All three species are broadcast spawners with larvae potentially being distributed widely by tides and ocean currents. For the purposes of assessment and management, it is therefore assumed that beachworms in NSW constitutes a single multi-species management unit.

Catches

Reported annual commercial catches of beachworms increased from 3.8 tonnes in 1984/85 to a historical high of 37.7 tonnes in 1996/97 and averaged 20 tonnes per year over 1997/98 – 2004/05. Catches then declined steadily from 2005 onwards to 5.4 t in 2019/20. Anecdotal information provided by fishers ascribes this decline to recreational anglers changing to using plastic baits rather than beachworms. Over 2009/10 – 2019/20, commercial catches have averaged 7.4 t per year. Recreational anglers are permitted to take up to 20 beachworms per day. Results of recreational angling surveys estimated the recreational harvest at about 2.9 t in 2000/01; 2.5 t in 2013/14 and 1.5 t in 2017/18. While these estimates have a level of uncertainty associated with them, this apparent decline probably also reflects the switch to use of plastic baits by recreational anglers. However, this is not currently confirmed by objective evidence. The catch by indigenous fishers has been estimated at <0.5 tonnes per year.

Stock assessment

NSW beachworms are currently assessed using fishery dependent catch and effort information, particularly catch rates (catch per unit effort – CPUE) which provide indices of abundance for the various estuary regions. In contrast to the decline in

catches, commercial unstandardised catch rates (CPUE) remained stable at or above 3 kg/fisher day over much of the period 1994/95 – 2019/20, only dropping below that level briefly over 2006/07 – 2007/08. Catch per fisher day has decreased slightly since 2009/10, whereas catch per hour has increased slightly, as a result of the hours fished per day decreasing from about 3.5 hrs/day in 2014/15 to 2.5 hrs/day in 2019/20.

At the level of the four most important Estuary Regions, standardised CPUE (catch/hr) has remained stable at or above the recent 10-year average in Regions 3 (Wooli – Laurieton), 4 (Laurieton – Tuggerah Lakes) and 6 (Wollongong – Ulladulla), and has only declined to below the 10-year average in the northernmost Region 1 (Tweed Heads – Evans Head).

Stock status

The NSW beachworms stock is currently classified as sustainable. Fishery dependent data mainly reflect the status of Port Hacking. Based on trends in CPUE, the stock appears to have remained stable at recent average catch levels for at least the past decade, with most CPUE indices being at or above the recent 10-year average. The stability in CPUE indicates that the current catches are sustainable. However, lack of significant increases in CPUE, and low amounts of data from other locations, suggest the TACC should remain at the current level, until indicators confidently reflect an increase in stock size.

Economic considerations

Pipis are the most important component of the EGHF, with the proportion of estimated nominal GVP attributed to Pipis has increased from approximately 26% in 2009/10 to 79% in 2020/21. In contrast, the proportion of estimated nominal GVP associated with beachworms has decreased from approximately 47% in 2009/10 to a low of 12% in 2016/17. The contribution of estuary cockles and ghost nippers to estimated nominal GVP has remained relatively stable (between 8 and 20% for each species) since 2009/10.

While no quantitative information is available, an understanding of the nature of the Ghost Nipper and Beachworm fisheries leads to the conclusion that capital investments in gear and vessels are low compared to many other commercial fisheries. While capital investment to harvest Pipi and Cackle is also low, the cost of marine biotoxin management planning to permit human consumption is high. Costs are particularly high for establishing an approved harvesting area and the benefits uncertain. The distribution among shareholders of benefits is also likely to not accrue proportionally to those that invest in obtaining the approval to allow harvesting in a new area.

Market Information

Pipi and Cackle

The NSW Cackle Fishery has always serviced the seafood market. In contrast, the NSW Pipi fishery transitioned from a low value fishery for the recreational bait market to a predominantly high value seafood resource. Pipis are utilised by the restaurant trade as well as being consumed at home. Economically, Pipis are the most valuable component of the EGHF Fishery. Pipis from NSW compete with Pipis from South

Australia and Victoria in the marketplace. The Papi catch in the South Australian fishery is substantially larger than the NSW Fishery, although the closed season in South Australia between 1 June and the 31 October creates a potential market opportunity for the NSW Fishery. When NSW beaches are closed to the take of Papis for human consumption due to biotoxin levels, commercial fishers are still permitted to take and sell papis for bait. This provides them an alternative market during these times, albeit at a lower price. Based on Sydney Fish Market prices, Papis fetched approximately \$21.00 per kilo in 2020/21. Although variable, prices have shown a general upward trend from 2012/13, with prices peaked in 2009/10 at approximately \$35 per kilo. No information could be sourced for the price of Papi for bait.

Sydney Fish Market prices for Cockles have ranged from approximately \$3.00 to just under \$10.00 per kilo from 2006/07 to 2020/21. Although variable, there has been a general upward trend in prices during this period with the highest price in the period recorded in 2020/21. The price per kilo of Papis and Cockles is sensitive to volume. Their prices are also linked, as there can be a level of substitution between them in the marketplace. However, the exact nature of the interrelationship is not well informed by empirical data. Industry report that discussions with Sydney Fish Market have indicated that Papis were one of the few species that were heavily impacted by the Covid Omicron restrictions that occurred late last year. Industry also anecdotally reports a stronger demand in the home market for Cockles compared to Papis. For the home cooking market, NSW Papis compete with those from interstate which are available in convenience packaging with enhanced shelf life.

Ghost Nipper and Beachworm

Both Ghost Nippers and Beachworms are not sold in a traditional seafood market, as they are destined solely for the recreational fishing bait market. Ghost Nippers are sold live in NSW, although some value-added frozen products are emerging in Queensland. Beachworms are sold live or as a cured/frozen product. Live products are sold directly to specialist bait shops and the provision of these baits to recreational anglers allows these shops to differentiate themselves in the marketplace. Although not quantified, the supply of live bait can contribute positively to enhancing recreational fishing tourism activities as well as servicing dedicated local anglers.

Quota Usage, Transfers and Holdings

The EGF-HG quota market has not yet matured. Quota was allocated only at the end of 2018-19 and uncertainties in the economy because of COVID, have also partly coincided with the new operation of the quota market. Initial allocations for all four species/species groups resulted in quota being concentrated in a small number of businesses. This initial quota allocation largely reflected historical catch for each species, although all fishers that held access shares for the period considered in the allocation formula received at least a small allocation. Over half of the Beachworm quota shares were initially allocated to five fishing businesses and over 80% was initially allocated to 11 businesses. This general distribution of Beachworm quota shares remains the same with five shareholders holding 54% of Beachworm quota shares. Quota usage during the current fishing period is low with only at

approximately 27% of the quota used with 63% of the fishing period completed. This is slightly lower than comparative quota usage in the preceding fishing period.

Some consolidation of Pipi quota share holdings has occurred. Initially, Pipi quota shares were allocated to 58 fishing businesses, with over half allocated to 10 fishing businesses. As at the 15 February 2022, there were 49 fishing businesses with Pipi quota shares with approximately 61% allocated to nine fishing businesses. Quota usage during the current fishing period is low with only 34% of the quota used with 63% of the fishing period completed. This is lower than comparative quota usage in the preceding fishing period. This is likely due to market and harvesting disruptions.

No information could be sourced on the initial allocation of cockle quota shares, but as at 15 February 2022, 80% of the cockle quota was allocated among three shareholders and 99% of Cockle quota shares are distributed among 10 shareholders. Cockle quota usage during the current fishing period is high with approximately 85% of quota used with 63% of the fishing period completed. It is higher than comparative quota usage in the preceding fishing period.

Quota shares for Ghost Nippers are highly concentrated and the harvest is focussed in Port Hacking. Around 95% of Ghost Nipper quota shares were allocated to just three fishing businesses and some further but marginal consolidation has occurred to 97% as at 15 February 2022. Quota usage during the last fishing period is low with only 41% of the quota used with 63% of the fishing period completed. However, this level of quota usage is similar to the preceding fishing period.

The economic benefits from Ghost Nipper harvest, including enhanced regional economic benefits, would be increased by greater access to suitable harvest areas outside of Port Hacking. This could potentially be undertaken by expressions of interest by suitable fishing business for access to additional quota shares and regionalisation of quota and management arrangements. An alternative would be to increase the volume of Ghost Nippers able to be harvested per quota unit outside of Port Hacking. Any further development of the Ghost Nipper fishery would need to ensure that existing quota holders are treated equitably.

Considerations for Current TACC setting

For Papis, the industry reports several market and harvest disruptions impact catch and while the price has remained relatively steady, the volume of quota used is low. While market disruptions may dissipate during the next fishing season, uncertainties in access and impacts because of extensive flooding and extreme weather may be felt during the next quota year. There is no strong economic imperative for either an increase or decrease in the TACC for Papis.

For Cockles, market demand continues to be high with a trend in increasing price. Industry reported that catches are limited by available quota and the TACC, and not by the availability of Cockles in the water or market demand. They highlighted that they could not meet the market demand during the latter part of the current fishing season. It is likely that there would be a short-term economic benefit from an increase in the TACC. However, incomplete reporting including the reporting of effort in the fishery requires a precautionary approach to setting the TACC independent of

economic benefits. Under the current management regime, Cockle harvesters can make business decisions as to when they harvest their Cockles. As such, they can spread their harvesting effort over the quota year to best meet market demands.

For Beachworms and Nippers there is a lack of economic information in which to guide quota setting. Both fisheries appear to be able to meet market demand with no significant changes to the market demand predicted.

Fishery management considerations

General Issues

The commercial EGF-HG management system is based on individual transferable quota for each species (or species group) under total allowable commercial catches (TACCs) determined by the TAFC. The COVID-19 pandemic has continued to affect both the catching of quota and fish markets, although both have shown some resilience to its impact.

The EGF-HG has four sub-fisheries - cockles, pipis, nippers and beachworms, with a total GVP of \$3-4 million per annum. The 'Estuary General-Hand Gathering Fishery Management Report – Total Allowable Catch Determinations 2022/23', March 2022 from NSW DPI provides more information on the management arrangements that apply to the fishery. The EGF-HG is a major source of bait for recreational fishers (beachworms, nippers and some pipis) with a focus in the Sydney region. Many commercial fishers hold multiple endorsements and quota, meaning they can fish in multiple regions for multiple species.

The ability to swap between target species or fishing areas enables fishing businesses to better adapt to supply and demand issues. Weather, biotoxin events, market price and seasonal demand are some of the external pressures on the fishery. A fishing business is better able to maintain cash flow in such circumstances. However, the flexibility in the quota system also means catch can be concentrated in relatively small areas (e.g., a single estuary) which can lead to localised depletion and affect all fishers utilising those areas. The TAFC made a recommendation to address this risk in its 2021 determination and progress against it is reported further on in this management section. While management of localised depletion remains unaddressed, there is limited scope for sustainable growth in the EGF-HG due to the risk of over-fishing.

In addition to the commercial catch, there is a significant recreational harvest for bait and Aboriginal fishers also harvest the four species. Possession limits apply to both sectors, but there is a high level of non-compliance along with an unknown level of illegal, unregulated and unreported (IUU) fishing. Inconsistencies between catches reported in commercial logbooks and quota reporting remains common and a large proportion of logbooks have incomplete catch and effort data. Such data gaps increase uncertainty in stock assessments and result in more precautionary catch levels. The TAFC made a recommendation to address this risk in its 2021 determination and progress against it is reported further on in this management section.

An additional consideration for pipis and cockles is food safety with harvesting areas subject to regular biosecurity checks to ensure the shellfish are safe for human consumption. Opening any new areas to harvesting is subject to significant data gathering, time and considerable cost. However, this is unavoidable and would be less onerous on individual fishing businesses if the sustainable catch of these species was able to increase.

In summary, an absence of policy and regulation for this fishery, along with poor catch and effort reporting, is holding back any potential growth of the EGF-HG.

Cockles

The TACC was raised from 29.2 tonnes to 45 tonnes last fishing period to better reflect average historic catch, as had been intended by DPI in the move to a quota management system. The cockle fishery is currently experiencing good market prices and the TACC appears likely to be almost fully caught for the 2021/22 season. In such circumstances, there is a higher risk of both quota evasion and IUU fishing. This adds to the already serious commercial and recreational non-compliance with fishing rules, including catch and effort reporting and bag limits respectively.

The limited data with which a sustainable TACC can be set for the cockle fishery remains the dominant stock assessment issue and underlies why the species is listed as 'undefined' in terms of its sustainability. To help address this NSW (industry and government) have recently been successful in receiving FRDC funding to investigate some of the key species' parameters that would underpin development of a formal harvest strategy.

Given the management, compliance and science challenges outlined here, the TACC should remain at 45 t for the next fishing year (2022/23) to enable progress to be made against them. While the risk the 45 t TACC poses to the fishery is unknown, historic fishery catches suggest that it is highly likely to be sustainable in the short term. Lowering the risks to cockle stocks by identifying management units within the fishery requires investment and commitment from both industry and government. This would then enable the TAFC to make an evidence-based decision about changes to future TACCs.

Pipis

The pipi TACC is 156 t, having been raised slightly from 147.4 t the previous year, based on a recent stock assessment which stated around 150 t of fishing mortality was sustainable. Pipis are the most valuable component of the EGF-HG, contributing over half the GVP. There is a history of overfishing this species with historic annual catches exceeding 300 t p.a. The commercial minimum legal size (4.5 x 3.2 cm) has probably assisted in ensuring good recruitment to the adult stock, although this has not been quantified. The current biomass is greater than 28% of initial biomass (in areas open to commercial fishing) which is above the commonly used 'overfished biomass' level of 20%. However, it is unlikely to be as high as commonly used 40-60% target levels for adult biomass, meaning the TACC should be set at a level at which the rebuilding of the stock can continue. Considering the above, the TACC should remain at 156 tonnes for the next fishing year (2022/23).

Nippers

The Port Hacking nipper fishery supplies the Sydney market with bait. It is assessed by NSW DPI as sustainable. Shoalhaven/Crookhaven, Myall and Hawkesbury Rivers also make minor contributions to the overall NSW nipper catch. The historic commercial catch peaked at 5.1 t p.a. against a current TACC of 5.6 t.

Nippers are important to the Aboriginal people but quantifying historic catch at the state level remains problematic. The recreational catch is estimated between 2-4 t p.a. and IUU catch is regarded as low.

Given commercial fishery catch rates appear stable, the TACC is not constraining catch and there is no evidence on which to base a change to the TACC, the current TACC of 5.6 t should remain for the 2022/23 fishing year.

Beachworms

A single TACC for all of NSW is used to manage several species of beachworm. The fishery is assessed as sustainable by NSW DPI under the current 8.5 t TACC with generally stable catch rates around the long-term average. Recreational catch is around 1 t p.a. While there are concerns about the Kingscliff Beach stock, it reinforces the need for a DPI policy about how localised depletion should be managed. Notwithstanding this concern, the state-wide TACC of 8.5 t appears sustainable for the 2022/23 fishing year.

Departmental responses regarding progress against TAFC recommendations made in 2021

- 1. To support the setting of sustainable catch limits at various scales (e.g., regional or estuary) the Department develops a policy and any necessary statutory instruments for these fisheries to guide the TAFC when it considers determinations that seek to set sustainable catch levels below a state-wide level.*

This may be considered during the development of a Harvest Strategy for this fishery. Harvest strategies are currently in development for Lobster, Spanner crab and Mulloway. Further harvest strategies will be developed in a staged process to provide guidance to decisions of the Secretary or the TAFC in making total allowable fishing determinations under the Fisheries Management Act 1994.

- 2. The Department takes immediate steps to ensure the commercial sector completes its logbooks; ensures there is an appropriate education and compliance regime in place to increase recreational sector compliance and in future provides coordinated Departmental advice to the TAFC regarding estimated total fishing mortality for each of the EGHG Fishery species/species groups.*

No changes to current monitoring and enforcement of commercial catch and effort reporting requirements have been implemented.

The Department has commenced the Integrated Angler Monitoring Program, which involves repeat state-wide surveys of recreational fishing (similar to the Survey of Recreational Fishing in New South Wales and the ACT 2013/14 (West et.al. 2015))

every two years. The most recent survey was completed in 2017/18 (Murphy et al. 2020). Detailed information regarding recreational harvest estimates is provided in the Stock Assessment Reports for each quota species.

3. *Economic information be collected for the EGHG Fishery that focuses on assessing profitability in the fisheries and the underlying drivers and constraints to profitability. DPI is seeking to better understand these economic and social values of the industry and to establish a monitoring program to track how they change over time.*

NSW DPI has engaged BDO EconSearch to produce an annual time series of economic and social indicators for NSW commercial fisheries. A report will be produced for each fishery for three financial years (Financial Years 2019/20, 2020/21 and 2021/22). The objectives of the monitoring program are to:

- inform discussions and decisions about fisheries management with evidence to demonstrate the economic contribution of commercial fisheries to New South Wales and its regions, and
- provide data for developing harvest strategies The monitoring program includes all activities associated with NSW commercial fisheries. This includes fishing activity, associated business and administration operations and fisheries management. The economic contribution indicators will quantify the effects that NSW commercial fishing activity has on the broader economy though processing, capital expenditures of fishing businesses and flow-on effects elsewhere.

T AFC comment against progress

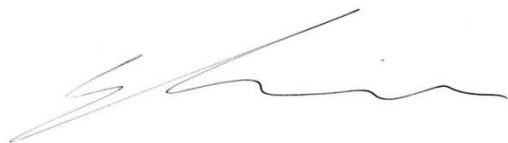
Regarding Recommendation 1, the T AFC notes the harvest strategy process that is underway and understands the need to prioritise these. However, this does not directly address the need for state-wide policy approach to setting catch levels at various spatial scales, which is a necessary part of the fishery management system and remains a high priority recommendation from the T AFC. In relation to Recommendation 2, and consistent with the commentary in the 2021 and this 2022 determination, there is an urgent need to improve both catch and effort reporting and compliance in the EGF-HG sector. If compliance does not improve, the T AFC's confidence in setting sustainable catch levels remains low and any expectation that T ACCs can be increased should be tempered accordingly. The T AFC strongly urges both DPI and the industry to address poor catch reporting and compliance, so the full benefits from these fisheries to NSW can be realised. Progress is being made against Recommendation 3 and the T AFC looks forward to considering the finalised BDO EconSearch report for the EGF-HG sector.

Determination

The Total Allowable Fishing Committee (TAFC), pursuant to Part 2A of the *Fisheries Management Act 1994*, determines that the commercial catch of species in the Estuary General Fishery - Hand Gathering sector should be controlled and allocated through the following measures:

Species	Catch Limit 2022/23 (tonnes)
Pipi (<i>Donax deltoides</i>)	156
Cockles (<i>Anadara trapezia</i>)	45
Ghost Nipper (<i>Trypaea australiensis</i>)	5.6
Beachworms (3 species of <i>Onuphidae</i>)	8.5

Signed (for and on behalf of the TAFC)



William Zacharin
Chair, TAFC

19 April 2022

Appendix 1: Map of NSW coastline showing the main ports of landing, broad fishing zones and estuary fishing regions (1 to 7) for commercial catch and effort reporting.

