Economic analysis & Social and Economic monitoring following the NSW Commercial Fisheries Business Adjustment Program

Prepared for the Department of Primary Industries, New South Wales

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Executive Summary

Need for the BAP

During the twentieth century commercial fisheries in NSW had been managed to facilitate jobs and supply of seafood for local and overseas markets. Historically too many licenses had been issued and by the 1990s fisheries management shifted towards preventing overfishing, and a reform of NSW fisheries was commenced through the adoption of share managed fisheries in the Fisheries Management Act (1994). Rock lobster and Abalone fisheries became regulated by catch quotas and shares were in place by 2000, but other share management fisheries did not have catch quotas or equivalent effort restrictions put in place.

By the 2000s economic conditions had declined for NSW commercial fisheries, for a mixture of commercial reasons, such as high production costs, and regulatory reasons, including the closure of fishing grounds for recreational fishing havens and marine protected areas. Business certainty was also undermined by the existence of fishing rights that were not often used, but if they were to be used may have resulted in overfishing. Reviews of fisheries management called for improving the economics and sustainability of the Industry through having more direct linkages between shares and limits on catches or effort.

After coming to government in 2011 the Liberal National Party Government announced their intention to reform NSW commercial fisheries. This involved moving from the existing system with various forms of regulation on the input side, towards output controls (individual transferable quotas (ITQs), in the form of annual kilogram catch limits) for the fisheries where this was possible, and tighter input controls (individual transferable effort (ITEs), in the form of annual fishing days limits) for multispecies fisheries where output controls were not feasible. This reform came to be known as the Business Adjustment Program (BAP).

It was a reform that had been inevitable since the early 2000s, given the NSW Government's commitment to share management embodied in the 1994 Act. It was extremely complex given the nature and the scale of the fisheries involved and the multi-operational patterns of fishers in commercial businesses. This not only posed an issue for government and industry, but also for the team in assessing the many elements of history, equity and other factors in this highly complex adjustment program. In some ways it is too early and simple to say whether the BAP 'worked', as the BAP has raised many issues of equity and process that have been contentious and raised important issues in fisheries and their governance. As is usual with fishery allocations, there are people who are aggrieved for various reasons.

Need for economic analysis of the BAP & ongoing social and economic monitoring

Due to the complexity of NSW fisheries and their management arrangements it took some years to develop the reform package, with the BAP implementation announced in 2016. Despite extensive consultation with Industry over the BAP, there was strong resistance on the part of many in the fishing Industry. There was a Parliamentary Inquiry about the BAP in December 2016.

The information provided to the Inquiry indicated widespread distress as a result of the reform process, and while some in the Industry agreed that the BAP would improve economic conditions for the Industry, many expressed concerns that the BAP would worsen their personal business viability (NSW Government 2017a). The recommendations from the Inquiry included that a social

impact assessment of the BAP should be conducted. A framework for assessing the social impact of the BAP was commissioned (Schirmer et al. 2017) but no assessment was conducted.

This report was commissioned in part to fulfil the recommendations of the Inquiry. It includes a retrospective evaluation of the economic and social impacts of the BAP, insofar as that was possible with existing data and the project scope, and the recent completion of implementing the BAP.

The second part of this project looks forward to the future of managing fisheries in NSW. There is at presently no ongoing monitoring of social or economic aspects of NSW commercial fisheries. NSW commercial fisheries management is moving towards a harvest strategy, so it is crucial to establish a baseline of social and economic information and a program for ongoing monitoring to enable the prediction of likely outcomes of different scenarios before making policy decisions. The project included developing and implementing a survey of fishers which may be easily repeated periodically, but this survey cannot provide all of the information needed. The report includes recommendations about the necessary components for effective ongoing social and economic monitoring. One of the main values of this report is to provide information about the situation in fisheries in 2019, as a reference for future monitoring.

Retrospective evaluation of the BAP

The project Terms of Reference required a retrospective evaluation of the economic and social impacts of the BAP. This was done through:

1. Surveying available data to assess the impacts of the BAP on the 'security, viability and value' of the commercial fishing Industry, having regard to the objects of the Fisheries Management Act 1994

2. Developing and conducting a survey of commercial fisheries stakeholders, suitable for ongoing monitoring, but also to collect information that the NSW Government can use to better understand and monitor the social and economic impact of the reforms

For the purposes of the evaluation of the BAP the high level criteria in the Terms of Reference had to be distilled into research questions that could be answered through an economic analysis using existing data, and through the project questionnaire (see Table 1).

Table 1. Distilling high level criteria from Terms of Reference into criteria evaluable with the available data

Terms of Reference key terms	Relevant evaluable criteria	Research questions	Data
Security	Secure access to fisheries resources	Has the BAP improved security of access by commercial fishers to fisheries resources?	Survey data DPI data Existing literature
Viability	Profitability in the commercial fishing Industry	Has the BAP improved profitability for the commercial fishing Industry? Has the BAP improved Gross Value of Production per fishing business at the fishery level?	Existing literature Survey data DPI data
	Sustainable management of fisheries resources	Has the BAP improved the management of fisheries resources? Has the BAP reduced the risk of latent capacity (potential overcapacity)?	Existing literature Survey data DPI data
	Ability to respond quickly to changing conditions by having access to different fisheries	Has the commercial fishing Industry retained diverse shareholdings?	DPI data
Value	Dollar value of businesses, and of fishery shares	Has the BAP improved the monetary value of fishery shares or of fishing businesses?	DPI data Survey data
	Non-monetary values of wellbeing and satisfaction with business/work among business owners and fishers	Has the BAP improved business satisfaction? Has the BAP improved wellbeing among fishing business owners and fishers?	Survey data Existing literature

Caveats on data

The two main sources of data for the retrospective evaluation of the BAP – existing DPI data and the stakeholder survey – had deficiencies for the purposes of a robust evaluation.

Existing DPI data: The BAP proceeded without an established monitoring and evaluation framework, so the objectives were not aligned with indicators and data suitable for evaluating the extent to which those objectives were met. The most important data gaps for the economic analysis were: 1) very little data on the value of fishery shares introduced in the BAP; 2) no time series data on costs and revenue for the commercial fishing Industry to enable an evaluation of profitability and incomplete data on share transfer prices.

Stakeholder survey: The project scope allowed only for an online questionnaire. Online questionnaires are suitable for capturing values and perceptions, including levels of satisfaction with relevant topic areas in a semiquantitative and qualitative form. These are useful as part of the evaluation of the BAP, but online surveys are not suitable for collecting objective economic data, such as figures on costs and revenue, and are not the best way to obtain qualitative data on the complex interconnected social and economic issues involved in the BAP. The evaluation should also have encompassed these sorts of data, as specified in the Limitations and Recommendations sections of the report.

Forward-looking social and economic monitoring

The project Terms of Reference specified that the commercial fisheries stakeholder survey to be developed and delivered should be suitable for ongoing social and economic monitoring, to collect information that the NSW Government can use to inform decision making. This report constitutes a record of fishery performance in 2019, which can be used as a reference point for future monitoring.

The survey constitutes one part of such monitoring, but the scope of the project precluded developing a thorough framework for ongoing monitoring. Developing an ongoing social and economic monitoring framework for NSW commercial fisheries is one of the key recommendations from this project. The section on ToR 2.2 includes suggestions on how a framework might be developed, and suggestions for the data and collection methods that could be useful.

Results: what we found

Terms of Reference 1 Economic analysis

Table 2: Summary of findings from this report

Key terms and Research questions	Answers
Security: Has the BAP improved security of access by commercial fishers to fisheries resources?	The introduction of ITQs/ITEs has improved security of access for those now holding quota. Ongoing monitoring is needed to ensure that unintended consequences from quota management do not arise. Currently there is no evidence of industry consolidation. The BAP did not alter the sovereign risk aspect of security of access for Industry.
Viability: Has the BAP improved profitability for the commercial fishing Industry?	There is no cost and revenue data available to directly answer the question. Most survey respondents report that their profitability is worse since the BAP. Since many fishers incurred debt to buy shares in the BAP it seems unlikely business profitability would improve in the short term. Significant increases in fishery performance (eg, from higher catches or cost reductions) would be necessary to improve profitability in the medium term.
Viability: Has the BAP improved Gross Value of Production per fishing business at the fishery level?	Since 2015/16 GVP per fishing business has improved for Ocean Trawl and Ocean Haul, but not improved for Estuary General, Estuary Prawn Trawl or Ocean Trap & Line fisheries.
Viability: Has the BAP improved the management of fisheries resources?	The BAP instituted quota management, which has been found in other fisheries to lead to improved ecological and economic sustainability. Overfishing was not an existing problem in these fisheries. BAP-related catch per unit of effort (CPUE) data does not yet show a change.
Viability: Has the BAP reduced the risk of latent capacity?	Latent capacity has likely been reduced through increasing minimum shareholdings in some fisheries in order to decrease the numbers of endorsements. Total numbers of entitlements in BAP fisheries have substantially declined between 2009 and 2019. Fishing business numbers show a decline from 2016.
Viability: Has the commercial fishing Industry retained diverse shareholdings?	The available data indicate diversity of shareholdings across fishery share class types has reduced since 2016. Investigating whether fishing practices are in fact less diverse and if so why was beyond the project scope. Given stakeholder assertions that the generalist fisher business model requires flexibility in responding to fishing and market conditions, diversity of shareholdings should be monitored as part of understanding Industry viability.
Value: Has the BAP improved the monetary value of fishery shares or of fishing businesses?	There is no reliable available objective data to assess changes in the monetary value of fishery shares or fishing businesses through time. Survey responses are mixed on this topic. Some say their business value has increased, others say it has declined.
Value: Has the BAP improved business satisfaction?	Cannot yet be determined. Most survey responses indicate poor business satisfaction.
Value: Has the BAP improved wellbeing among fishing business owners and fishers?	Not yet. Most survey respondents report that the BAP has reduced their satisfaction with life. Reported life satisfaction among commercial fisher respondents is noticeably lower than that reported by rural residents in Australia generally, as is reported wellbeing in all domains of life. Reported satisfaction with the safety domain of life is particularly low.

A 'without intervention' scenario would likely have been continued low or deteriorating economic performance in the NSW commercial fishing Industry, and business uncertainty. This could possibly have led to biological overfishing, because of the latent excess capacity that existed.

Consideration of the economic analysis of the BAP with regard to the objects of the Act show that the BAP possibly introduced some intergenerational inequity in requiring fishers to take on debt to continue fishing. Young new entrants and older fishers both face greater difficulties than middle aged fishers in demonstrating serviceability and business track record to commercial banks. Fisheries should be more viable after the BAP in that there is probably reduced risk from latent capacity, and in that ITQs and ITEs generally improve ecological sustainability. However, it is less clear that the BAP had a positive influence on viability in terms of fishery profitability, because of the debt fishers had to incur to buy shares. Likewise, the social and economic benefits to the wider community of NSW appear to be inhibited by the significant increase in debt in the Industry.

A thorough evaluation of governance and consultation between Government and Industry was beyond the project scope, but open text comments from the online survey shed some light on governance and consultation in relation to the BAP. Despite considerable effort on the part of DPI to consult with Industry about the BAP over a period of years, many fishers remained opposed to the BAP. Most of these comments were critical about governance and consultation regarding the BAP, especially in the following areas: perceptions of unfairness in the allocation of shares; perceptions of unfairness in that Aboriginal fishers have not had to meet the same share requirements as the rest of the Industry; and perceptions of failures in information provision regarding the Subsidized Share Trading Market (SSTM).

Terms of Reference 2 Social and economic monitoring - survey

Respondents in the project online questionnaire survey who reported best life satisfaction and wellbeing across all domains of life were those who have exited the commercial fishing Industry. Open text comments provided in the survey indicate that reduced workload and stress as well as government assistance with subsidies and buyouts contributed to this group having higher wellbeing. The groups of respondents who reported poorest life satisfaction and wellbeing were new entrants to the commercial fishing Industry, and those who did not engage with the SSTM.

Most online questionnaire survey respondents reported that the BAP had a negative impact on their business. Of a list of fourteen possible positive and negative impacts of the BAP, the three most commonly selected impacts were: reduced household income; being forced to adjust their business against their will; and having to purchase more shares to continue fishing. Most survey respondents report that the contributions their Industry makes to their community is lower now than before the BAP. Most respondents report that the number of people employed in their business has not changed much as a result of the BAP. A slight majority of respondents said they now work longer hours than they did before the BAP. Of those who report longer hours, some say they are working extreme hours on the days they can fish, as a result of the BAP moving towards effort quotas that limit the number of days fishers can work in certain fisheries.

The online questionnaire survey is useful as one part of ongoing monitoring, but robust social and economic monitoring of commercial fisheries requires much more. A monitoring framework should be developed with stakeholder and expert input. The first step is to determine appropriate social and economic objectives for NSW commercial fisheries management. Then indicators should be developed that will reveal whether or not those objectives are being met, and data that is suitable for

those indicators should be collected and analysed. Very little of the existing DPI data on commercial fisheries is useful for economic monitoring. Industry will need to cooperate in allowing economic data to be collected, so it will be necessary to design a process for collecting data in which Industry has confidence their financial details and interests will be protected. In addition to the online questionnaire survey more social qualitative (eg, interviews) and quantitative (eg, employment statistics) data would be useful.

Recommendations summary

1. Establish a social and economic monitoring framework for NSW commercial fisheries as a matter of high priority and urgency
2. Investigate further whether the levels of commercial debt incurred as a result of the BAP are damaging Industry viability, and if so, consider interventions to alleviate that debt
3. Consider instituting protections from changes to resource access in commercial fisheries management
4. Investigate more effective ways of doing consultation and policy development

Contents

Glossary

Commercial fishing license – a person must not take fish for sale in NSW unless the person is authorised to do so by a commercial fishing licence. Authorisation is provided by endorsements on the licence.

Endorsement – an authority on a commercial fishing licence that allows a person to take fish for sale in a share management (or restricted) fishery. The minimum shareholding for a share class must be held to be eligible for an endorsement in that share class.

Fishery – a class of fishing activity. Share management fisheries are described in Schedule 1 of the Fisheries Management Act (1994).

Fishing business – a fishing business is comprised of components (e.g. **shares**). One person or family may own more than one fishing business.

Minimum shareholding – the minimum number of shares that must be held in an 'original' share class to be eligible for an endorsement to take fish.

Nominated fisher – a fisher who holds a commercial fishing license and is nominated by a fishing business owner to take fish on behalf of that owner. Also known as an 'authorised fisher'.

Original shares – (also known as 'access shares'). Shares issued for the commencement of each share management plan, corresponding to the types of endorsements available in each fishery.

Quota shares – issued as further classes of shares during the BAP. They do not give rise to an endorsement, rather entitle the holder to a share of the annual Total Allowable Catch or Total Allowable Effort. Most quota shares relate to specific species or species groups that are managed by catch quota (i.e. **species quota shares**). In the Ocean Trawl fishery, prawn effort quota shares relate to effort quota management (i.e. **effort quota shares**).

Share – a right to a proportion of the total access issued in a share managed fishery. There are numerous classes of shares (i.e. **share classes**) in each share management fishery.

Introduction

Context

In NSW the number of commercial fishing Industry operators has been in decline since the 1990s. The causes are complex and include issuing of too many licences, adverse changes in business operating costs, and competition from imported seafood. In spite of these economic challenges, the fishery resources have not been subject to biological overfishing.[1] In the 1990s, as part of a general shift in Australia towards Ecologically Sustainable Development (ESD), the NSW government committed to share management under the Fisheries Management Act (1994). Some fisheries, such as Abalone and Rock lobster had individual transferable quota schemes (ITQs) applied as a form of share management. Management formed 'restricted fisheries' in 1997. Quotas were not introduced at that time but effort was restricted through limiting the number of endorsements to fish. Commercial fisheries management strategies were implemented in the early 2000s. A series of decisions about marine parks, recreational fishing havens, and the administration of fisheries buy-out processes also impacted the Industry (Select Committee on Recreational Fishing 2010; Voyer et al. 2016).

The NSW Government was planning to reform fisheries management to improve certainty over resource access for the restricted fisheries and thereby improve business and investment conditions since 2004 but the complexity of the Category II fisheries other than Abalone and Rock lobster made progress difficult. In 2007 these became Category I fisheries, with share allocation giving most fishers an equal number of shares, which created a distortion in relation to levels of harvest and past 'catch history'. This was viewed as inequitable by fishers and led to adjustments in the years to come, all of which raised issues of equity among Industry. In 2007 the Department of Primary Industries (DPI) were advised of the need to enable the NSW Industry to 'autonomously self-adjust', with recommendations to reduce latent effort, implement minimum shareholdings, have regulatory reform and provide exit payments for fishers to leave the fishery (Stevens 2007). From 2009 the Government held several rounds of consultations with Industry, across a change in government from Labor to Liberal National Party, to work out a plan. An 'exit grant' scheme took place in 2010. In 2012 an independent review was undertaken (Stevens et al. 2012), which recommended a structural adjustment program to accompany other changes in governance and consultation mechanisms.

The NSW Government (2012) accepted the report and the then Minister for Primary Industries Katrina Hodgkinson announced a reform to address business conditions such as 'poorly allocated fishing rights and excessive red tape' (Hodgkinson 2012). The reform package came to be known as the Business Adjustment Program or BAP. The objectives of BAP (NSW Government 2014) were to:

1. improve the long-term viability of the NSW commercial fishing Industry;
2. improve the strength and value of shareholders' access rights (i.e. shares); and
3. provide shareholders with improved opportunities and flexibility to tailor their access.

NSW fisheries and their management regimes are very complex, so working out the reforms was difficult and time-consuming. There were extensive consultations with Industry including through

[1] Assessments about the environmental sustainability of fisheries are carried out by the Commonwealth Government as part of implementing the *Environmental Protection and Biodiversity Conservation Act* (1999). Assessments of NSW fisheries may be found at: https://www.environment.gov.au/marine/fisheries/nsw-managed-fisheries .

share linkage working groups, consultation papers, and port meetings. A Structural Adjustment Review Committee (SARC) of independent consultants was formed to assist with the development of the BAP reform package (Cartwright et al. 2015). In the period 2012-2013 the SARC consulted with Industry and made recommendations to improve linking between the access licence and the restrictive measure through implementing catch quota shares where feasible, and where not feasible (for example in multispecies fisheries) effort restrictions. In some share classes the SARC recommended allocating new quota shares in proportion to existing shareholdings of access shares, though the larger operators needed to obtain more access shares to reflect their previous level of harvest. In other share classes where the level of distortion was much greater, an Independent Allocation Panel (IAP) process was proposed to reduce potential inequities that could arise through determining the allocation of new species and effort quota shares (Cartwright et al. 2015, see also McPhee et al 2018). The SARC also recommended reducing endorsement numbers through increasing the required minimum shareholdings.

The BAP involved many regulatory changes including to fishing boat licensing, traps, hooks, crew, and trip limits, but the main work of the BAP was to reduce the numbers of endorsements and link fisheries shares to catch/effort limitations. Overall the BAP moved towards instituting fishing rights in the form of individual transferable quotas (ITQs), with some effort quotas (ITEs, in the form of 'fishing days'), as a way of giving the Industry secure access to the resource. The BAP unfolded in stages, with the approach tailored to each class (NSW Government 2019), starting 2016 and ending 2019.

The BAP applied to 103 share classes within 24 share class groups within the five fisheries of Estuary General (EG), Estuary Prawn Trawl (EPT), Ocean Haul (OH), Ocean Trap and Line (OTL) and Ocean Trawl (OT) (NSW Government 2016d) (see Figure 1; Figure 2). The other share management fisheries of Abalone and Rock lobster were already quota fisheries and so were unaffected by the BAP. The BAP also did not apply to the restricted fisheries (Figure 3) and special permit fisheries.

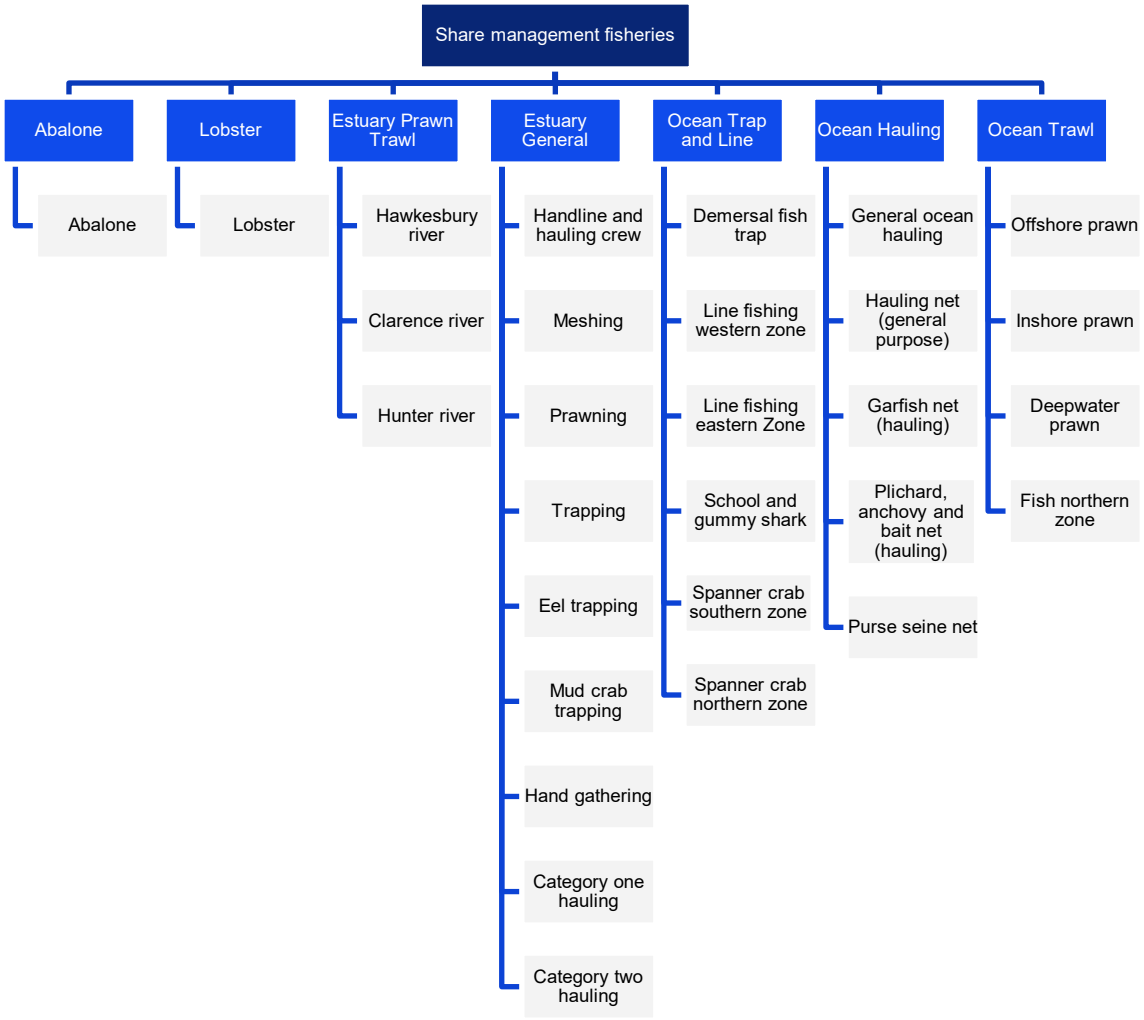


Figure 1. NSW commercial share management fisheries pre-BAP

Source: NSW DPI
Key:

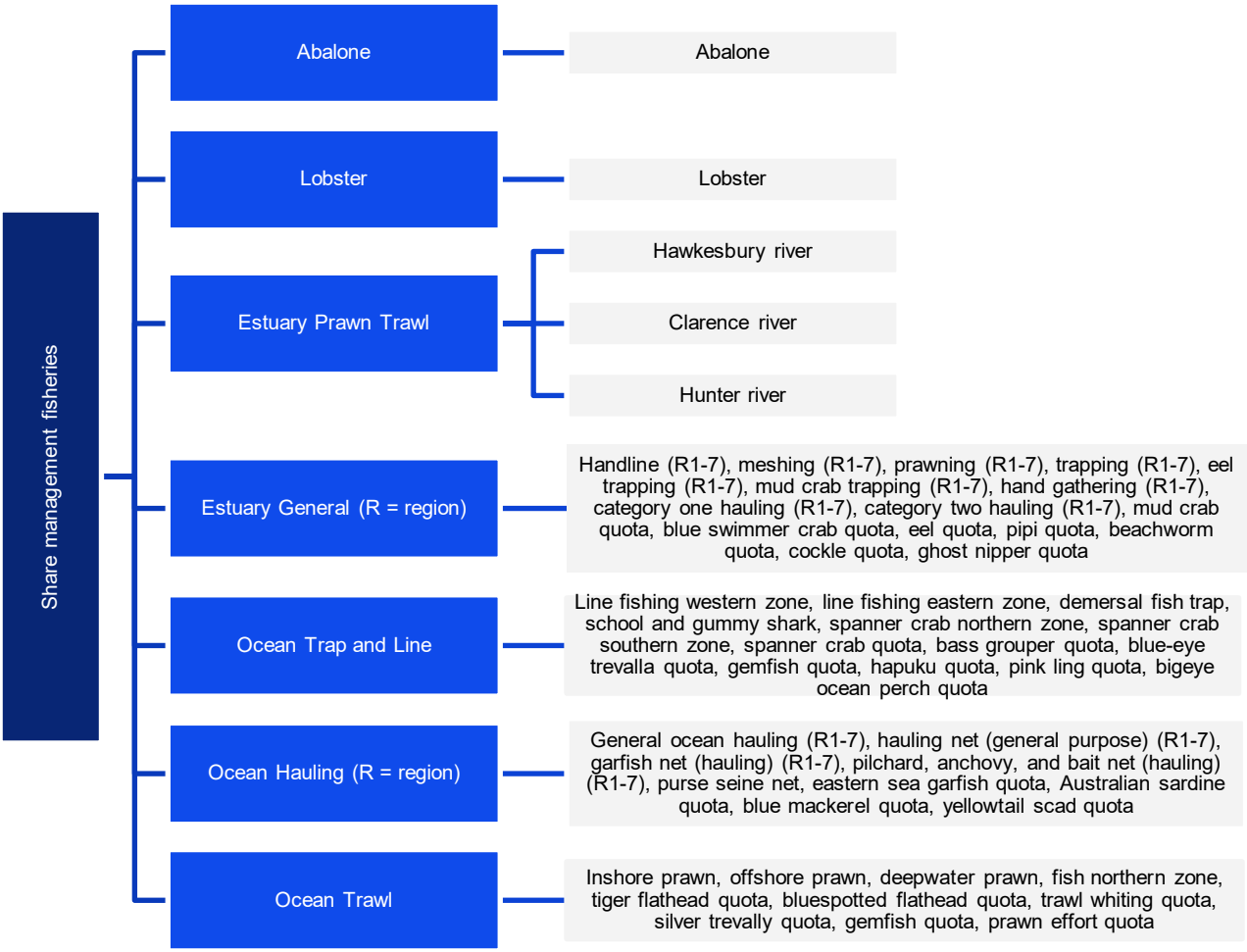


Figure 2. NSW commercial share management fisheries post-BAP

Source: NSW DPI

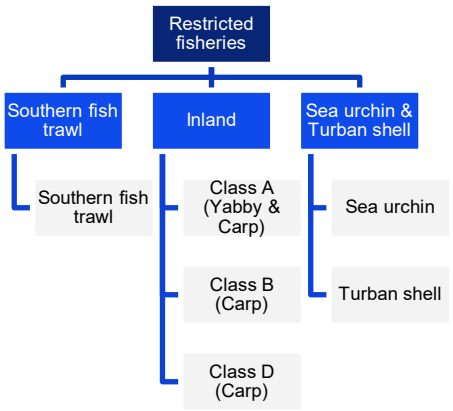


Figure 3. NSW commercial restricted fisheries (unchanged by BAP)

Source: NSW DPI

Government assistance was required to facilitate reduction of existing endorsements and introduction of fishery share arrangements to ease the way for those exiting the Industry and to allow those remaining to become more commercially viable under the new management arrangements. The government allocated $16 million for the Adjustment Subsidy Program which included business buy outs, for those wishing to consolidate or exit, and subsidised shares. Assistance offered to fishers for making adjustments to fit with the new regime included: financial advice; a cap on management fees; a community awareness program to build support for the NSW

commercial fishing Industry; assistance for fishing cooperatives; an Adjustment Subsidy Program for buying and selling shares; fishing business buyouts; low interest rate loans administered by the Rural Assistance Authority; and retraining assistance (NSW Government 2016f). Eventually a total of $18.12m was used by the NSW Government in the Adjustment Subsidy Program, including the SSTM and fishing business buyouts (excluding grants and loans).[2]

Share trading and the Subsidized Share Trading Market (SSTM)

Some people started trading fishing businesses and shares in order to position themselves for the future after the Government accepted the findings of the Stevens et al. (2012) review and announced there would be a reform process. Fishers tried to anticipate what the outcome of the reform would be, many wanted to position themselves with enough shares to be able to continue their business in the way that best suited their circumstances.

In addition to ongoing trading in fisheries shares, the NSW Government worked with university researchers to create an online market for share trading as a mechanism by which taxpayer funds would subsidize fishers needing to buy and sell shares to adjust their fishing shareholdings. The intention in using a market mechanism for this was to efficiently and impartially allocate subsidies through matching buyers and sellers holding existing excess access shares across the five fisheries (Bichler et al. 2019). The online market was called the Subsidized Share Trading Market (SSTM).[3] Application of public funds via this method was more appropriate to facilitating business shareholding adjustment as compared with previous buy backs that assisted businesses to exit the Industry.

Fishers interested in selling their shares or buying more to reach minimum shareholdings were asked to register for the SSTM by March 2017. Then in May-June 2017 an online 'exchange' was run with fishers selling and buying shares in these fisheries. Taxpayer funds were let into the trading in a way designed to assist those fishers wishing to leave the Industry to exit with a good price, and those wanting to maintain or increase their catches, to purchase more at a discounted price. The SSTM was an innovation in replacing traditional tender methods for fisheries adjustment (Bichler et al. 2019). Not unreasonably, many fishers were tentative about this new system, given this was the first time such a mechanism had been applied in NSW or Australian fisheries.

Why do social and economic analysis of the BAP?

A major policy program such as the BAP should have had economic and social impact assessments done before finalising the design and implementation of the policy. Without this assessment it is hard to understand the unintended negative social and economic impacts of a reform and how to avoid them. The extent of any internal economic analysis within DPI to evaluate the envisaged costs of the BAP to government and Industry is unknown, as are the costs and benefits of alternative ways to implement the BAP for different outcomes. One of the recommendations of the 2012 review was to increase the economic capacity within DPI as 'the capacity to properly account for fisheries economics in decision-making has diminished' (Stevens et al. 2012 pp.7-9). The economic analysis undertaken for the BAP (AgEconPlus 2015) was an assessment of the current fishing Industry profitability, the logic of share linkages and some projections for changes in individual share classes. However, the projected costs and benefits of the whole program from a public policy perspective were not captured in a single publicly available document. We have not been able to find documentation justifying how much money the Government should allocate to the reform for

[2] Personal communication, NSW DPI Fisheries, email 15 June 2020.
[3] Website information on the SSTM accessed 16 June 2020
https://www.dpi.nsw.gov.au/fishing/commercial/reform/historical-docs/adjustment-subsidy-program

different outcomes, and how much Industry would be expected to pay. Nor does there seem to have been an assessment of regulatory impact for the complex proposal that was the BAP.

The intention to reform the Industry had first been announced in 2012, but due to the complexities of NSW fisheries it took until 2016 to develop the reform package. There was also a great deal of 'horizontal violence' occurring within the Industry, with people feeling beleaguered attacking each other, adding to the distress about business uncertainty (Voyer et al. 2016). Many within the Industry expressed feeling that their concerns had been overridden in the consultation process and fears that their businesses would be ruined by the BAP (Voyer et al. 2016). In 2016, a Parliamentary Inquiry was announced into commercial fishing in NSW (NSW Legislative Council 2017a). A general timeline of the BAP process is presented in Figure 4.

One of the main recommendations of the Parliamentary Inquiry was that the NSW Department of Primary Industries commission a Social Impact Assessment of the BAP, and make the findings of the assessment public (NSW Legislative Council 2017b). NSW DPI commissioned Associate Professor Jacki Schirmer and colleagues from the University of Canberra to identify the impacts of the commercial fisheries reforms and Business Adjustment Program, and recommend a process to monitor these impacts (Schirmer et al. 2017). This report, however, was not a Social Impact Assessment of the BAP, rather it presented a range of methods that could be applied in such an assessment. The NSW Government commissioned the current project to conduct an independent study evaluating the social and economic impacts of the BAP in August 2019.

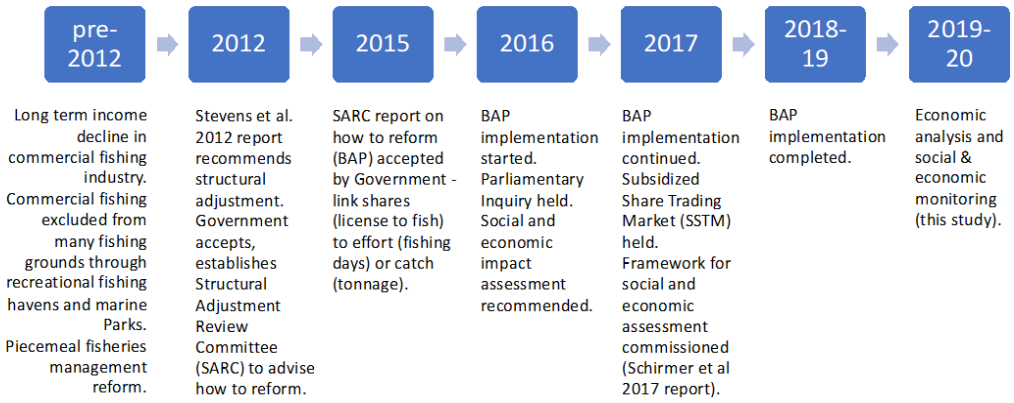


Figure 4. Overview of the BAP process 2012-19

Methods, data and limitations

The current study is not a full social or economic impact assessment (S/EIA). A formal S/EIA process would have required more time and resource intensive methods than could be fitted within the scope of this project. The project evaluates some of the economic and social impacts of the BAP using existing knowledge and DPI data, and has developed and implemented a survey for ongoing social and economic monitoring of NSW commercial fisheries.

Terms of Reference 1: Economic analysis

The ToR asked the team to provide economic analysis using available data including: reported commercial fisheries catch and effort data and economic, financial, investment and pricing information, from the period 2009/10 onwards, to assess the impacts of the BAP on the security, viability and value of the commercial fishing Industry. Available data in the literature and held by DPI, however, did not enable a fully comprehensive assessment of the BAP on security, viability or value. DPI provided to the authors a range of data to use for the evaluation, including on share ownership and transfers, reported landings, reported fishing event dates, and gross value of production. For the most part basic methods have been used in the economics analysis, with one more complex method using a Gini index (see Results section ToR 1.1 Security).

As far as we are aware, prior to implementation there were no economic projections made of the BAP and what security, viability or value would look like under different reform scenarios. Hence this post-event assessment has no baseline projections for comparison. Ideally, in order to examine the economic impacts of the BAP, an evaluation would compare the profitability, gross revenue, and/or value of businesses before and after the BAP reforms. Likewise, comparison of the value of fishery shares before the BAP, or changes in value in the years following the implementation of the BAP. These kinds of analysis were not possible, however, due to lack of data. No organisation collects time series data about profitability, gross revenue or business value of commercial fisheries businesses in NSW, so there is no reliable objective data to assess the economic performance of NSW fisheries over time. NSW DPI collects data on the trade in fisheries shares in terms of who bought and sold how many shares when, but it is not compulsory for the value of sales to be recorded when this data is supplied. Many of the trades recorded have no value attributed, or have a nominal value inserted, such as $1. Some of the nominal value trades may be between different businesses owned by the one business owner, for example, transfers between Smith & Co and Smith Pty Ltd. We use this data to estimate the value of quota trading in the 2012-2019 period, but it relies on the declared data being used to impute for zeros and nominal responses.

The research team explored with stakeholders during the survey design phase whether we could collect any of this kind of data with the project survey. As a method, an online survey is best suited for collecting data on values, perceptions and opinions. It is not a good method for collecting detailed objective economic data.

One problem is lack of trust meaning most fishers are unwilling to share financial data about their businesses. Even when fishers are willing to share this data, it is not easy for business owners to recall the detailed information needed to work out their business profitability or their gross revenue. They have to go back through their taxation records. Requiring survey respondents to do that would constitute a major disincentive for the survey, which would reduce the number of responses, meaning the survey would be less useful as a source of information. We included global questions on profitability and business impact but mainly avoided asking for information that would require respondents to go to their taxation records. For the full list of questions see Appendix 4 – Survey script. We did try to ask a question about business size but did not receive high quality useable

responses to that question (for further details about this question see Results section ToR 1.2.1 Viability: Profitability in the commercial fishing Industry).

Terms of Reference 2: Social and economic monitoring survey

The ToR specified refining and delivering a commercial fisheries stakeholder survey suitable for monitoring social and economic impact on an ongoing basis. The survey was co-designed collaboratively with DPI staff and Industry stakeholders. We engaged over several drafts, from the start of the project in August through to early October. The survey design took a long time due to the complexity of the issues involved in the BAP, and working out how to effectively capture that complexity in a survey that fit within the scope of the contract. Ideally, there would have been a qualitative interview element to the project before attempting the survey, in order to explore the various issues and distil the key points for a survey, but that was not within scope. The survey was distributed online, and open to all commercial fishers in NSW. DPI disseminated the invitation to participate in the survey via letter, email and SMS text message through their contacts database. In addition, we liaised with key Industry associations and co-operative managers to invite their networks of commercial fishers to participate.

A total of 207 commercial fishers participated in the survey, of whom two were fishing crew rather than fishing business owners and 17 were former commercial fishers who have exited the Industry (see Appendix 3). According to DPI there were 1,065 licenced commercial fishing businesses in 2019/20, but since many fishers own more than one fishing business the total number fishers is somewhat less than 1,065. Bearing in mind these caveats, **the survey response rate was around 19%.**

The survey questions were not made compulsory, meaning that the number of responses for each question was usually less than 207. The total number of responses for each question is included in the graphs and tables drawn from the survey data presented in this report. We have no way of ascertaining whether there is a bias in respondents' choices of which questions to answer or not. We cannot therefore say that the responses for particular questions represent the full 207 participants. We can only say that the responses for particular questions represent the number of participants who answered that question, which is made explicit in our presentation of the survey material.

The survey was open from 25 October to 9 December 2019. Due to the pressure many communities were under with bushfires during this period we did not send out an SMS warning that we were closing the survey, but hope that the long period of the survey being open means everyone who wanted to participate was able to. Anyone who visited the survey webpage after 9th December saw a message saying that the survey is now closed, but that if people want to leave a written response about the BAP we can include that in the analysis up to 20 December, they were then taken to a page with an open-text box to leave a written response.

In addition to the online survey being open to anyone wanting to participate we facilitated approximately 23 people to complete the survey via telephone with a member of the UTS research team. This was in order to make sure we had responses from a representative spread of fishers across different groups, including those who have exited the Industry, but was also to accommodate people with reading difficulties who were unable to complete the survey online. Furthermore, some people preferred to respond via letter or phone call with the research team, so as far as possible we have accommodated this data also.

DPI provided a list of 80 contacts spread across different fisheries and regions and across the four groups DPI identified as being of interest for the survey. The researchers sent an email to the list provided by DPI, and followed up twice by phone. If they did not respond at this point they were not pursued further. Interviews ranged from 30 minutes to 2 hours in length. This list also includes

fishers who requested directly to researchers to do the survey by phone. A breakdown of those surveyed via phone is presented in Table 3.

Table 3. Numbers of surveys completed with researcher assistance by phone

Continued/adjusted fishing business through BAP	7
Did not engage in SSTM	3
Exited the commercial fishing Industry	9
Entered the commercial fishing Industry	4
Total	23

In addition to the list of fishers who completed the survey by phone (Table 3) with a member of the research team, fishers contacted the research team because they wished to make statements in addition to or instead of responding to the survey. The team undertook 15 of these additional phone calls with fishers and received six submissions by email and two by handwritten letter. Notes from the phone calls and the written submissions were analysed along with the open text box portions of the survey, and relevant, illustrative quotes have been included in the report.

Survey results: representativeness of sample, and possible non-response bias
A comparison of the demographic details of the survey sample and the NSW commercial fishing Industry details held by DPI show that our survey sample is demographically representative of NSW commercial fishers (see Appendix 3 – Demographics of survey respondents).

The most common non-response bias is unit non-response which 'takes place when a randomly sampled individual cannot be contacted or refuses to participate in a survey' (Ritz 2013). Mohadjer et al. (1994) explains 'there is always a potential for item nonresponse bias whenever sample persons who did not participate in the survey have somewhat different characteristics than those who did.' It is possible that people who chose not to participate in the survey biased the results. The overall survey results show strongly that most respondents feel the BAP has been a negative influence on their businesses and wellbeing (see Results section on ToR 1.3.2 Value: Non-monetary values of wellbeing and satisfaction with business/work among business owners and fishers). It is possible that people with negative feelings about the BAP were more motivated to complete the survey than people who have neutral or positive feelings about the BAP, constituting a non-response bias. It is not feasible to eliminate this kind of bias, neither is there a viable way to identify or measure it.

Limitations

Survey results: trade-off between anonymity and verification
During stakeholder consultations in the drafting phase for the survey some stakeholders expressed concerns that some respondents may exaggerate their responses, or possibly make multiple responses to bias the survey results. They suggested that in order to be sure about who had completed the survey, responses should be linked to individual fishing business license numbers. It was clear from Industry consultations and from the previous experiences of the research team on this topic, however, that at this time many respondents would only feel comfortable to participate in the survey if it was completely anonymous and their responses could not be traced back to them. In future iterations of the survey for ongoing social and economic monitoring, if trust is rebuilt between DPI and the Industry, it may be useful to link responses to fishing business numbers. This would clearly reveal which parts of the Industry are doing well, which less well, which need attention, and enable DPI staff to follow up with individuals having particular difficulties. This should only be done, however, if the Industry comes to trust that DPI will use such information for the benefit of Industry. It also requires DPI and Industry to build a shared understanding of why this

data is relevant for all parties. Relations between DPI and Industry have varying levels of trust now, and it will take concerted and consistent efforts on the part of DPI over a considerable period of time to reach that point.

During the survey design stakeholders expressed concern as to whether interest groups might attempt to bias the survey though putting in multiple responses, or having people from a range of different locations put in false submissions aligned with the interests of the group. The researchers checked for this in various ways and determined that the 207 responses all seem valid. The first way we checked was by looking at the IPN of the computers from which the response was submitted. There were small numbers of responses coming from the same IPN, but upon investigation these appeared to be different family members with fishing businesses completing the survey from their perspective. There were no duplicate responses, each response was different. We checked also the location of the IPNs, to make sure none were coming from unlikely locations, such as the USA. Almost all of the responses were from within NSW, and for those that were not there was a valid reason for the submission coming from outside NSW visible in the response (eg, the participant was currently living outside NSW). Finally, when analysing the qualitative text box responses to questions the specific details mentioned seemed to the researchers to be genuine.

The study lacks an interview component

A thorough evaluation of the BAP would use not only an online survey but also a face-to-face interview component to talk to fishers. NSW fisheries are hugely diverse, from high value low volume fisheries such as abalone and rock lobster to high volume low value fisheries such as mullet, from capital intensive fisheries such as trawling, to low tech beach hauling. The fisheries have been managed in different ways and the reform process was very complex. Complex issues are best dealt with by first having a qualitative component, such as with interviews, to refine down the questions that can then be pursued via a survey and examination of quantitative data. Moreover, the levels of distress existing over the BAP within the commercial fishing Industry meant that many people wanted a chance to ‘have their say’ to a human and were frustrated by being given an online survey. Some participants are not able to use digital platforms, including for reasons of disability.

Results

The results have been presented as far as possible in the structure of the project Terms of Reference (ToR, for the full ToR see Appendix 1).

Terms of Reference 1: Economic analysis

This ToR asked the team to:
Provide economic analysis using available data including: reported commercial fisheries catch and effort data and economic, financial, investment and pricing information, from the period 2009/10 onwards, to assess the impacts of the BAP on the security, viability and value of the commercial fishing Industry.

For the purposes of evaluation the terms 'security, viability and value' had to be turned into research questions that could be addressed with the available data (see Table 1 earlier, and Table 4). The first part of the economic analysis, therefore, is organised as per these research questions.

Table 4: Evaluation questions for security, viability, and value

Security	Viability	Value
• Has the BAP improved security of access by commercial fishers to fisheries resources?	• Has the BAP improved profitability for the commercial fishing Industry? • Has the BAP improved Gross Value of Production per fishing business at the fishery level? • Has the BAP improved the management of fisheries resources? • Has the BAP reduced the risk of latent capacity? • Has the commercial fishing Industry retained diverse shareholdings?	• Has the BAP improved the monetary value of fishery shares or of fishing businesses? • Has the BAP improved the non-monetary value of business satisfaction? • Has the BAP improved the non-monetary value of wellbeing among fishing business owners and fishers?

ToR 1.1 Security

Secure access to fisheries resources

Research question: Has the BAP improved security of access by commercial fishers to fisheries resources?
Answer: The introduction of ITQs/ITEs has improved security of access for those now holding quota. Ongoing monitoring is needed to ensure that unintended consequences from quota

management do not arise. Currently there is no evidence of industry consolidation. The BAP did not alter the sovereign risk aspect of security of access for Industry.

In implementing caps on catches and effort and increasing minimum shareholdings to reduce the latent capacity risk, the NSW Government intended to improve security of access to fisheries resources for fishing rights holders. Logically, these changes should improve security of access, barring unanticipated influences, but evaluation is necessary to be able to say that the objective was in fact achieved.

The objective to improve security was not established beforehand with indicators with appropriate data collected for measuring the extent to which the objective was achieved, so it is difficult to evaluate. With data for evaluation limited to the available data and the online survey, we have evaluated it in two ways: 1) whether Industry consolidation is occurring in quota fisheries; and 2) a discussion of sovereign risk, which is broader than quota management.

Industry consolidation in quota fisheries

Although quota management can achieve excellent outcomes for biological sustainability and profitability in fisheries, various unintended negative consequences of quota management have also been identified in Australian fisheries (Hoshino et al. 2019). Some of these arise as a 'flipside' to the security of access that comes with the quota style of fishing right, in that non-quota holders are excluded from the fishery. Especially when quota prices are high, quotas constitute a capital barrier to entry to the fishery. This is not inherently a policy problem – exclusion of all but the optimal number of fishers is often the explicit policy intention. In some cases, however, quotas can act to exclude desired participants, such as new entrants, low socio-economic status fishers, and Indigenous fishers. These may contravene legislated policy objectives or, particularly in the case of excluding new entrants, threaten Industry viability.

We considered how we could evaluate whether problematic exclusion is occurring, with the available data, and settled on using share ownership figures to investigate whether the introduction of quota management is leading to consolidation in the Industry. One of the potential negative outcomes of quota management is a tendency towards consolidation – quota fisheries often end up excluding small businesses and become dominated by a few large companies (Abayomi and Yandle 2012; Agnarsson et al 2016). Australian examples include the Southern bluefin tuna fishery, where soon after ITQs were introduced the fishery, which had been spread over more than 200 fishing businesses became consolidated into just thirteen companies (Campbell et al 2000). The Australian Southern bluefin tuna quota experience is widely seen as a policy success in that an unviable fishery was rehabilitated into a hugely successful fishery, but consolidation in other quota fisheries in Iceland and New Zealand have been more controversial because of the effect of making smaller scale operations unviable.

We have investigated whether consolidation is happening in new NSW quota fisheries by looking at share ownership data and seeing whether, since the introduction of quotas, some companies are starting to accumulate bigger quota holdings than others. We used a Gini index analysis to answer this question.[4] On the GINI index equality is measured between zero and one, with zero being full

[4] GINI index is a measure of statistical dispersion intended to represent wealth distribution. It is the most commonly used measurement of equality. A GINI index of zero expresses perfect equality. If xi is the wealth or income of person i, and there are n persons, then the Gini coefficient G is given by:

equality and one being extreme inequality. Industry consolidation would mean a widening gap (inequality) between larger and smaller shareholdings, so if consolidation is occurring we would expect the lines in Figure 5 to trend up towards one.

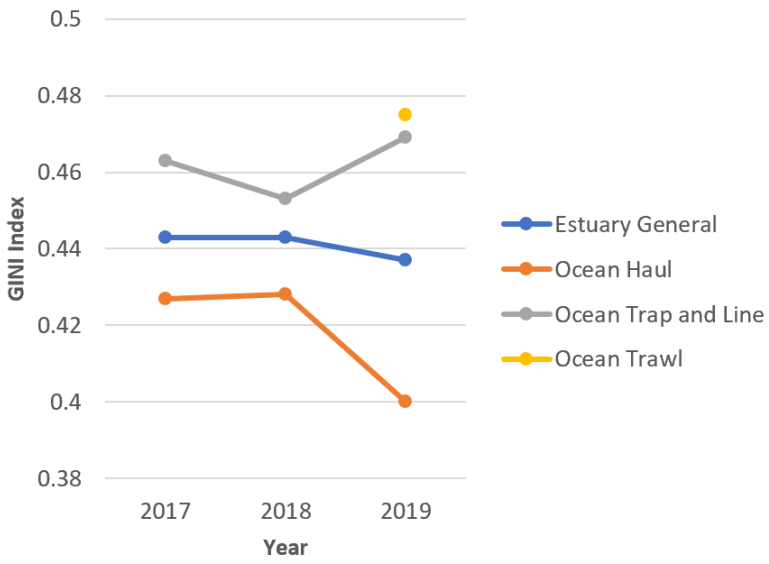


Figure 5. Changes in Gini index in quota shares owned by fishing businesses in BAP fisheries 2017-2019

Source: DPI share ownership data, 2013-2019
Notes: Quota shares started to be introduced from 2017, so the analysis starts then. The Gini analysis was performed only quota shares only, not access shares, because if consolidation is occurring it will be visible in the quota holdings. The Estuary Prawn Trawl fishery has no quota shares so is not part of the analysis. The Gini index was calculated for each species in each fishery for each year, then the average for the fishery is plotted in the graph. Ocean Trawl quota was introduced in 2018 but no trades are recorded in this data until 2019 so is indicated by a dot with no line.

Figure 5 shows that the disparity in quota shares owned by businesses has remained stable in the three years since quotas were introduced to these fisheries. This indicates that thus far there is no significant consolidation of quota ownership occurring at the fishery level. Future analyses may want to look at a lower level to see if consolidation is happening for some species, such as higher value species.

Even if future analyses indicate that consolidation is occurring, it is not necessarily a policy problem. Further investigation should be then undertaken to see whether negative unintended consequences are occurring from quota management. For example, consolidation in conjunction with high quota prices can make it very difficult and high risk for new entrants to join a fishery, possibility threatening Industry viability in the long term.

$$G = \frac{\sum_{i=1}^{n}\sum_{j=1}^{n}|x_i - x_j|}{2\sum_{i=1}^{n}\sum_{j=1}^{n}x_j} = \frac{\sum_{i=1}^{n}\sum_{j=1}^{n}|x_i - x_j|}{2n\sum_{i=1}^{n}x_i} = \frac{\sum_{i=1}^{n}\sum_{j=1}^{n}|x_i - x_j|}{2n^2\bar{x}}$$

Sovereign risk in NSW commercial fisheries

Although quota shares, as a kind of property right, should improve security of access to fisheries resources into the future, the BAP was implemented in a way that left many in the Industry feeling the BAP undermined their security of access. The BAP replaced the existing access fishers held with new minimum shareholdings and quota shares. The Independent Allocation Panel and SSTM processes were intended to enable fishers to continue to operate at the levels they had prior to the BAP without having to buy more access, but administrative complexities meant this did not work as intended in all cases. A common refrain on the part of Industry about the BAP is 'I had to buy my job back'. On the other hand, the position of the NSW Government is that fishers were allocated shares and only had to buy more shares if they wanted to expand their business. The complexity of the BAP, some of which resulted from fisheries management decisions in previous decades, mean that both of these statements can be true, depending on the specific situations of fishers.

Prior to 2007, fishing businesses had an associated validated catch history, established in the mid-1990s from logbook records. In 2007 the NSW Government allocated shares in the fisheries that eventually went through the BAP process, some based on equal allocation and others on a loose connection to catch histories. Some of those who held endorsements from 2000 thought that the new shares created in the BAP would recognise their pre-2007 catch history that had been previously validated by the government. Some believed that catch history would not be used and that an equal allocation principle based on currently held shares would be used in BAP allocations. Some thought allocation of shares under the BAP would involve more recent catch history (not the pre-2007 catch history).

BAP allocation involved a mixture of the second and third options. For some fisheries equal allocation was used but the SARC independent consultants identified that application of a share linkage allocation based only on equal allocation across shares would create a significant distortion (i.e. the disparity between shares held and existing fishing activity levels) for a range of species taken under some NSW fishing endorsements. They proposed that this would place an unacceptable and unintended substantial financial burden on a relatively small number of fishing businesses in share classes where those businesses accounted for a high proportion of the total recorded landings from the fishery (SARC 2015; McPhee et al. 2018). The Independent Allocation Panel (IAP) work aimed to reduce such inequity in the share allocation process and included catch history in allocations for these fisheries, often in a ratio of 80:20 catch history to equal allocation. The catch history used was an average of several years from recent logbook entries.

Reasons Industry people had problems with the allocation process included: people who viewed the NSW Government as having committed to using the pre-2007 catch history were disappointed; people who held shares in fisheries that were allocated equally and were very active fishers did not have their catch history recognised (conversely, people who held shares in these fisheries and had not been very active had a windfall); and those who expected equal allocation but had catch history applied in their fishery were caught out if they had not been maintaining their catch history in recent years. Moreover, the catch history system benefited specialists more than generalists, since over the time period used to generate the catch history generalists may have caught little in some fisheries, meaning they missed out on being allocated enough for a minimum shareholding in those fisheries, whereas the occasional use of those fisheries may have been very important to their business model. Finally, there were arguments against the use of logbook entry averages for catch history. One issue raised by some was inaccuracies in logbook data, which was arguably fishers' own responsibility. Another concern is the that fishers rely on the good years to survive the bad years, and if their catch or effort is capped at the average then they are prevented from having those good years. Some of these issues touch on Industry viability, but they also speak to security, in that these are the reasons behind the persistent claims that the BAP required fishers to invest in access to maintain existing levels of business activity.

Another layer of complexity impacting fishers' security of access to the resource arose from the timing of the allocation process in relation to the SSTM. One of the goals of the SSTM was to give a subsidy to fishers for whom the allocation process meant they needed to buy more shares so that post-BAP they would have the same level of fishing rights as pre-BAP. It mostly worked that way, especially for the fisheries where the allocation decisions were made before the SSTM. But for some fisheries the SSTM occurred before the allocation decisions were made, so these fishers were not clear how things were going to work for them and some felt they had to invest in shares to ensure they could stay in the fishery. Moreover, in the months preceding the SSTM in some fisheries there were concerns that the shares were already being traded and not enough would be available in the SSTM. Some of these fishers felt if they waited for the SSTM they might miss out so they bought shares before the SSTM and thereby missed out on the subsidy.

So while it is technically correct that the allocation and subsidy process was intended to enable fishers to maintain their existing level of access without investing more, and for many this was the case, the claim by some fishers that the BAP forced them to 'buy their jobs back' is justifiable. Furthermore, many fishers previously experienced having their fishing access removed through processes of establishing recreational fishing havens and no-take zones in marine protected areas. From an Industry perspective, cumulatively since 2000 sovereign risk has undermined security of resource access for a considerable proportion of the NSW commercial fishing Industry.

Responses to the online survey indicate that the BAP has not increased perceptions of security within the Industry. One question gave a list of 14 options for the question 'what happened to your business as a result of the BAP?' The option 'I feel that my fishing rights are now more secure' was the least selected option (see Figure 21). This experience is not unique to NSW, with one study finding that commercial fishers around Australia suffer high levels of regulatory stress, in part due to insecurity of access to fisheries resources that they depend on for their livelihoods (King et al 2019).

The BAP has not ameliorated sovereign risk in NSW commercial fisheries. In a legal case about the BAP the judge found: 'It seems clear, from the pre-existing Management Plan, that the intention of the legislature and the intention of the Minister and/or Secretary was that the licensing system and the Management Plan was not to be permanent and could be changed on notice. Notice was given' (Elliott v Minister administering Fisheries Management Act 1994 [2018] NSWSC 117, para 154). This case confirmed that statutory law can override many of the expectations of fairness held by commercial fishers. The NSW Estuary General Management Plan Regulation (2006) was being referred to and has the right to change the Plan embedded within in it 'For the purposes of section 64 of the Act, any amendment to this Plan is authorised' (Part 10 General, 47). Thus while the BAP aimed to improve fishing rights, at the same time the fishers were vulnerable to having their rights impacted by change under the Management Plan. This is contradictory. Feedback from Industry in the online survey and the Elliot v Minister legal case both indicate that fishers are being given contradictory messages of fuller fishing rights via the BAP while those rights can be easily removed by statutory Management Plans whenever the Government decides.

The NSW Government could provide greater rights security by instituting more accountability around changes to commercial fisheries access, as in other state jurisdictions. For example, in the South Australian Fisheries Management Act (2007), the amendment power in s46 constrains the Minister to minor non substantive changes, unless subsection (d) applies – 'if the plan or the regulations provide that a change of a specified kind may be made by amendment under this section—to make a change of that kind'. Section 49 states that if the Minister wants a change not contemplated in the Plan, or directly authorised by the Act, the Minister must follow the entire Management Plan planning procedure outlined in s44, including tabling a report of a review of the Plan in both Houses of Parliament. If the NSW Government were to introduce a similar mechanism

to make it harder to change commercial fisheries access then Industry trust in secure access may be repaired.

ToR 1.2 Viability

ToR 1.2.1 Viability: Profitability in the commercial fishing Industry

Research question: Has the BAP improved profitability in the commercial fishing Industry?
Answer: There is no cost and revenue data available to directly answer the question. Most survey respondents report that their profitability is worse since the BAP. Since many fishers incurred debt to buy shares in the BAP it seems unlikely business profitability would improve in the short term. Significant increases in fishery performance (eg, from higher catches or cost reductions) would be necessary to improve profitability in the medium term.

There is no available time series data on profitability in the NSW commercial fishing Industry. One previous study established a baseline for financial year 2012/13 showing poor profitability in Estuary General and Estuary Prawn Trawl, with businesses from other share class groups being just viable (Voyer et al 2016). Without data on commercial fishing costs and revenue before and after the BAP it is very difficult to make a robust evaluation of the impact of the BAP on profitability.

The author's experience in surveying to collect cost and revenue data from commercial fishers in previous projects in NSW and Victoria was that it would not be feasible to collect such data via the online survey that was part of the current project. We tried through numerous iterations of the survey draft in consultation with stakeholders to devise questions that would at least give information about the gross revenue from businesses. We gave participants the option of listing up to three species, the average price per kilogram for 2017-2018, and average catch in kilograms. Only 71 responses were partially completed. The responses were inconsistent, with some respondents only listing species and size of catch, but not price, or vice versa. Reporting analysis on that question would thus be highly speculative, and not an accurate representation of the real value of businesses. As a method, online surveys are much more suitable for eliciting global statements about profitability than detailed figures relating to income and costs.

In answer to the global question about profitability a slight majority of survey respondents (62%) said the BAP had a negative impact on the profitability of their business, with 30% reporting that the BAP had a neutral impact on their profitability, and 9% saying their profitability has improved (Figure 6).

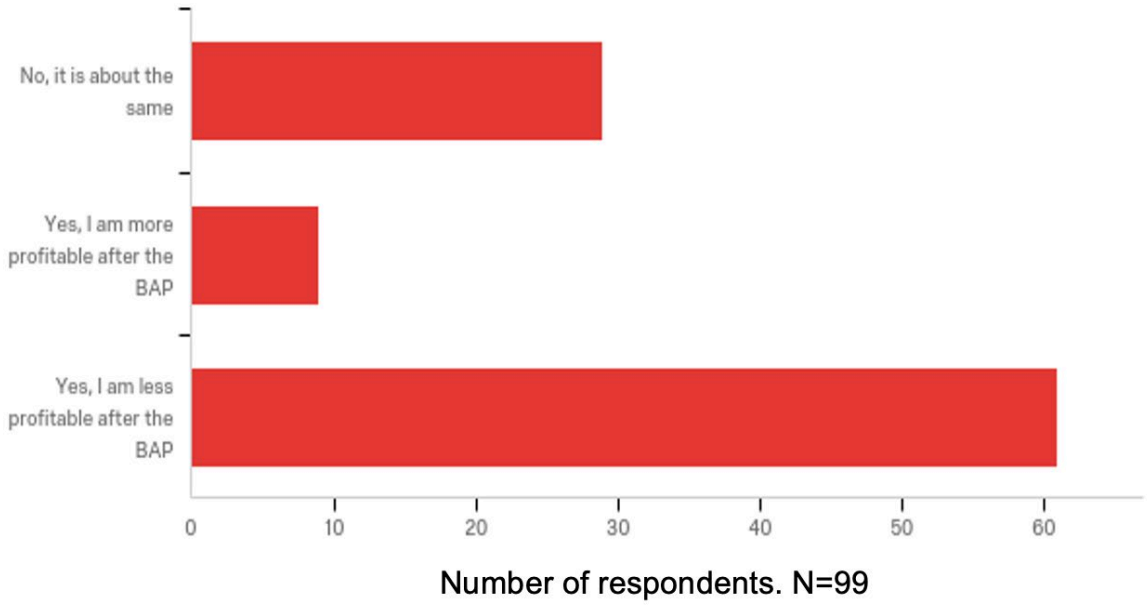


Figure 6. Survey Q26 Has your fishing business profitability changed as a result of the BAP?

Open ended text responses in the survey included:

> *I can work smarter now and make better money than previously. It [the BAP] has removed a fair bit of competition and that makes life easier, and just more profitable.*
>
> *I have been robbed of the business that I worked hard to achieve to now having a business that is not as profitable and have to work a lot harder.*
>
> *[W]ith buying extra shares and then having quota put on it has made it less profitable. I don't think we have seen the worst of it.*
>
> *I continued in my business, but I will make less profit as I have to lease quota.*

It seems unlikely that the BAP would improve profitability in the short term, because these fisheries had low profitability before the BAP (Voyer et al 2016), and the BAP has increased costs by requiring businesses to buy shares. It is possible in the future, if BAP reforms improve revenue in relation to costs, then the BAP may improve profitability. We explore the obstacles the BAP has posed to improving profitability in the following analysis of how the costs of the Industry restructure in the BAP have been covered.

Estimated value of share transfers in the BAP

In this section we estimate the available information on the value of share trades in the 2012-2019 period using DPI records. This period was chosen for analysis as it relates to the share transfers that took place after the announcement of the intention to reform the fishery. There is no binding requirement for fishers to declare the value of a share when logging the transfer with the Department, though the forms enable a value to be inserted voluntarily. Thus the share transfer data has some values recorded, others as zeros, or just a nominal value of $1 entered. In the share transfer data in the 2012-2016 period, 66% of share transfers by number had values recorded, whereas this reduced in the 2017-2019 period, to 27%. The difference after July 2016 is probably due to the NSW government abolishing transfer duty on the sale of business assets (including fisheries shares), which meant fishers were no longer required to report prices. Prior to July 2016,

when the rate of transfer price reporting was higher, fishers may have under reported transfer prices to minimise their transfer duty liability.

The available share value data was referenced to the number of shares transferred. The values that were declared were examined to remove 'outliers' and flagged to identify zero or nominal responses. The cleaned declared data were used to impute share transfer values for incomplete entries based on the number of shares transferred. Variations in the values of shares between different share classes was taken into account, being grouped as low, medium and high for estimation purposes. This method is the best available approach under the data availability constraint and should be interpreted with caution given the low number of observations in some share classes. Table 5 reports estimates of the total transfers of funds between fishers, excluding 'paper transfers' between businesses held by one owner. They do not include abalone or rock lobster fisheries and their estimated total values for the years 2012-2019.

Table 5. Share transfers and estimated values 2012-2019, not including abalone or rock lobster fisheries[5]

Year	No. of Transfers	Total shares Transferred	Average Transfer value per share ($)	Total Value of Share Transfers ($)
2012 (Aug-Dec)	98	8,455	$ 96	$ 810,160
2013	338	31,363	$ 87	$ 2,737,069
2014	412	41,557	$ 93	$ 3,844,396
2015	480	43,458	$ 98	$ 4,278,611
2016	1,043	95,254	$ 107	$ 10,149,970
2017	843	86,022	$ 116	$ 9,977,966
2018	696	165,674	$ 78	$ 12,963,650
2019 (Jan -Nov)	531	140,305	$ 74	$ 10,369,098
Total	**4,441**	**612,088**	**$ 90**	**$ 55,130,919**

Note: These are estimates only, made from available data and should be treated with caution.

The total estimate of the value of funds exchanged in share trading in the 2012-2019 period was $55.1m (Table 5). Table 5 shows a total of $21.8m of share transfers in the pre BAP, 2012-2016 period. Then more transfers to an estimated value of $33.3m took place in the 2017-2019 period. The transfers represent both a sale and a purchase by businesses wishing to position their future fishing operations. On some occasions the seller is exiting the system, whereas some other transfers are sales with the intention to purchase other shares re-investing the proceeds from the sale. Therefore the total estimated value of transactions in Table 5, should not be taken as indicating the source of funds (sales/purchases, debt, equity or savings) which is discussed below. Some fishing business will also have had multiple transfers in either selling or buying shares.

Source of funds for share trades

The project survey asked fishers about the extent of their commitment in terms of savings (equity) and debt made in association with the BAP. In the project questionnaire there were replies from 123 of the 792 businesses sent the questionnaire (all fishing businesses registered with DPI) and of these 94 of the 123 replies (75%), had either used some of their savings, or taken debt for the BAP. The

[5] Subsequent to publication of this report in early September 2020 it was discovered that there was a gap in the data for share transfers in 2016 and 2017. The missing data was recovered and Table 5 amended accordingly. The corrected totals in Table 5 affect the numbers in Table 8 and in the text discussing Tables 5 and 8, so these have also been amended accordingly. The amended report was completed in November 2020.

responses were grouped by amounts and were analysed to estimate the total funds utilised by Industry from either their savings or loans presented in Table 6.

Table 6. Survey results - debt and savings used to buy fishery shares

Use of personal savings or debt	No. of replies	Assumed mean $	Total
$0	29	$ -	$ -
<$50k	47	$ 20,000	$ 940,000
$50-100k	28	$ 50,000	$ 1,400,000
$100-200k	11	$ 100,000	$ 1,100,000
>$200k	8	$ 200,000	$ 1,600,000
Total (792 businesses)	**123**		**$ 5,040,000**

In Table 6 the responses from the 123 replies are categorised and indicate that 94 had a conservatively estimated total of $5.04m of personal savings or debt used in the BAP. It is not known to what extent the sample has respondent bias, in that those who had taken debt would have possibly been more likely to reply to the survey. Similarly, it is also not clear the extent of recall bias, in that the question was answered in 2019 and some responses may have been referring back as far as 2012, rather than the post 2016 BAP period. However, there were 2,070 registered share transfers transactions valued at $33.3m in the post BAP 2017-2019 period (Table 5).

Table 7. Extrapolations of the sample of debt and savings sample results from the online survey

Sample as percentage of total	Estimate	Degree of extrapolation
15%	$33,600,000	High - unlikely
20%	$25,200,000	Moderate-likely
25%	$20,160,000	Limited- More likely

Taking all of this information into account, and extrapolating the survey respondents' reported use of savings/debt to the whole Industry, we consider that a conservative extrapolation would be $20.16m, with higher estimates being less likely (Table 7). We can triangulate this extrapolation with the figure of Industry inputs to share transfer values arrived at from subtracting the SSTM subsidy from the estimated total value of transfers in the BAP period 2017-2019 (see bolded line Table 8). The two estimates are similar.

Table 8. Sources of adjustment expenditure 2017-2019

Item	$	Sources
Values of Transfers 2017-2019	$33,310,000	Estimates from DPI share transfer records (excluding abalone and rock lobster)
Less: DPI SSTM subsidies	$11,620,000	DPI records
Balance: provided by Industry	**$21,690,000**	
Represented by:		
Loans to Industry from RAA	$6,740,000	RAA annual reports
Industry investment from savings and debt	$14,950,000	Balance from above

Note: We have used DPI's recorded amount of taxpayer funds spent on the SSTM of $11.6m. An additional $6.5m was spent by NSW Government on buyouts and other measures, which are not

part of the transfers considered in this table, although some of these funds may have been used for share transfers, reducing the industry investment component.

In Table 8 the previous estimates of share transfer values have the $11.62m of taxpayer funds applied to the SSTM leaving an estimated 'gap' of $21.69m to be met by Industry. This is sourced from $6.74m of concessionary loans from the Rural Adjustment Authority (RAA), leaving $14.95m provided by industry investing from savings and debt from commercial banks.

The survey question did not distinguish between savings and debt, so the actual amount of debt borrowed in the $14.95m total is not available. The debt incurred requires interest to be serviced and over a period of 5 to 10 years. For example, commercial business loans on $10m with an interest rate of 5-8% in the 2015-2019 period would have Industry wide interest payments of $500,000-$800,000 per annum. Even where businesses used savings rather than debt, there is still an opportunity cost. For example, a fishing business may use savings to buy shares and then the owner needs to take out an increased mortgage for housing than they would have otherwise. The public policy issue in forcing Industry to take on debt to restructure the Industry in the BAP can be seen in these estimates. Some of the open text responses in the survey reflect this problem:

> *I now have a debt to repay & struggle at times to pay household debt.*
>
> *Increase in management fees, loans, has impacted my business.*
>
> *I had to borrow over 40 000 dollars to purchase shares to meet minimum share limit to continue to operate then had to participate in the subsidized share trading scam to purchase more shares to meet the once again increased minimum share levels and on top of that pay the extortionate share management fees.*

Research question: Has the BAP improved Gross Value of Production per fishing business at the fishery level?
Answer: Since 2015/16 GVP per fishing business has improved for Ocean Trawl and Ocean Haul, but not improved for Estuary General, Estuary Prawn Trawl or Ocean Trap & Line fisheries (see Figure 7, or in table form in Table 9).

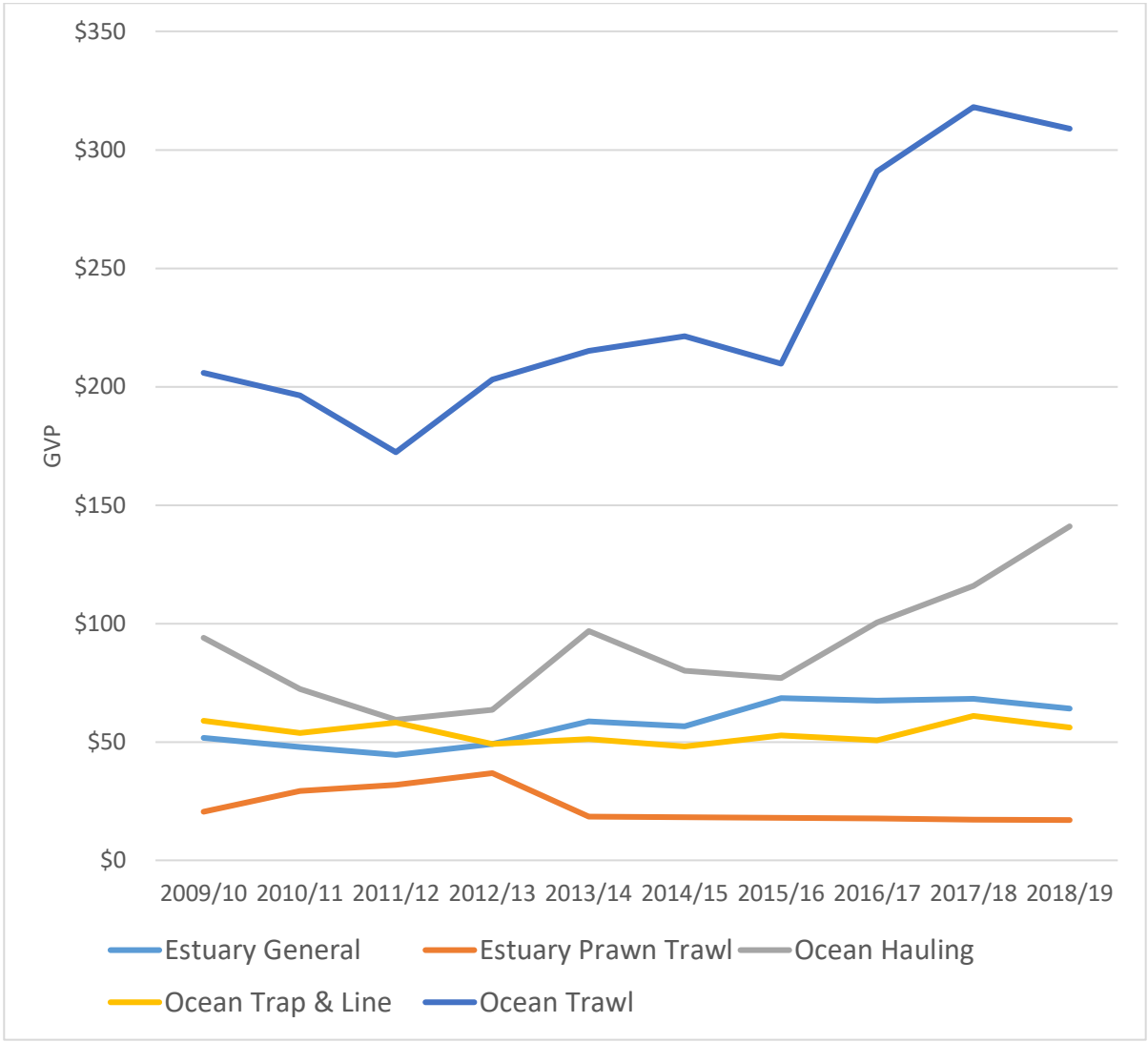


Figure 7. Gross Value of Production per Fishing Business reporting fishing activity ($'000) 2009/10-2018/19

Source: Source: NSW DPI 17-12-19 extract.
Notes: The figures in this graph have been adjusted for inflation (to 2018/19 terms) using Consumer Price Index information from the Australian Bureau of Statistics. It should be noted that GVP is not considered a reliable indicator for economic performance.

Table 9. Gross Value of Production per Fishing Business reporting fishing activity ($'000)

Fishery	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19
BAP Fisheries										
Estuary General	$52	$48	$44	$49	$59	$57	$68	$67	$68	$64
Estuary Prawn Trawl	$20	$29	$32	$37	$18	$18	$18	$18	$17	$17
Ocean Hauling	$94	$72	$59	$64	$97	$80	$77	$100	$116	$141
Ocean Trap & Line	$59	$54	$58	$49	$51	$48	$53	$51	$61	$56
Ocean Trawl	$206	$196	$172	$203	$215	$221	$210	$291	$318	$309
Non-BAP fisheries										
Inland	$36	$33	$91	$129	$86	$50	$145	$81	$139	$126
Abalone	$78	$118	$128	$147	$127	$125	$131	$126	$144	$142
Lobster	$99	$104	$113	$101	$139	$159	$172	$154	$169	$213
s37 Permit	$29	$19	$34	$29	$25	$29	$27	$27	$40	$45
Sea Urchin & Turban Shell	$12	$12	$13	$11	$9	$11	$18	$17	$14	$20
Southern Fish Trawl	$106	$105	$161	$112	$105	$79	$120	$130	$128	$139
All fisheries	$96	$88	$84	$88	$99	$97	$103	$112	$121	$123

Source: Source: NSW DPI 17-12-19 extract.

Notes: BAP fisheries are in blue text. The original data contains nominal figures, the figures in this table have been adjusted for inflation (to 2018-19 terms) using Consumer Price Index information from the Australian Bureau of Statistics.

ToR 1.2.2 Viability: Sustainable management of fisheries resources

Research question: Has the BAP improved the management of fisheries resources?
Answer: Probably. The BAP instituted quota management, which has been found in other fisheries to lead to improved ecological and economic sustainability. Overfishing was not an existing problem in these fisheries. BAP-related catch per unit of effort (CPUE) data does not yet show a change.

The project scope precluded a detailed assessment of whether the BAP improved the management of NSW fishery resources. Improved management analysis would require detail study of how changing in practices influence overall sustainability – something this assessment did not seek to do. Based on available data, below is a brief discussion of this question.

The implementation of direct (catch quotas) and less direct (effort quotas) controls on fishing in the BAP was intended to improve the sustainable management of fisheries. NSW fisheries did not have a systemic biological overfishing problem, so improved catches was not an objective of the BAP. Rather, the BAP was intended to protect against the latent capacity risk, a potential overfishing risk, that existed before the BAP. As far as we are aware the latent capacity risk was not quantified before the BAP, and the available data do not enable measurement of the extent to which the latent capacity risk has been reduced.

One widely used way of assessing sustainability in fisheries is looking at catches in relation to fisheries effort (catch per unit of effort, or CPUE). If CPUE declines, it may be that the fishery is unsustainable, whereas if CPUE remain stable or increase, this is one indication that the fishery is sustainable. We estimated CPUE by dividing reported landings by the number of fishing event dates reported. The CPUE does not show a clear change in response to the BAP (Figure 8). Use of CPUE in future evaluations would assist in understanding the long-term changes in fisheries management due to the BAP.

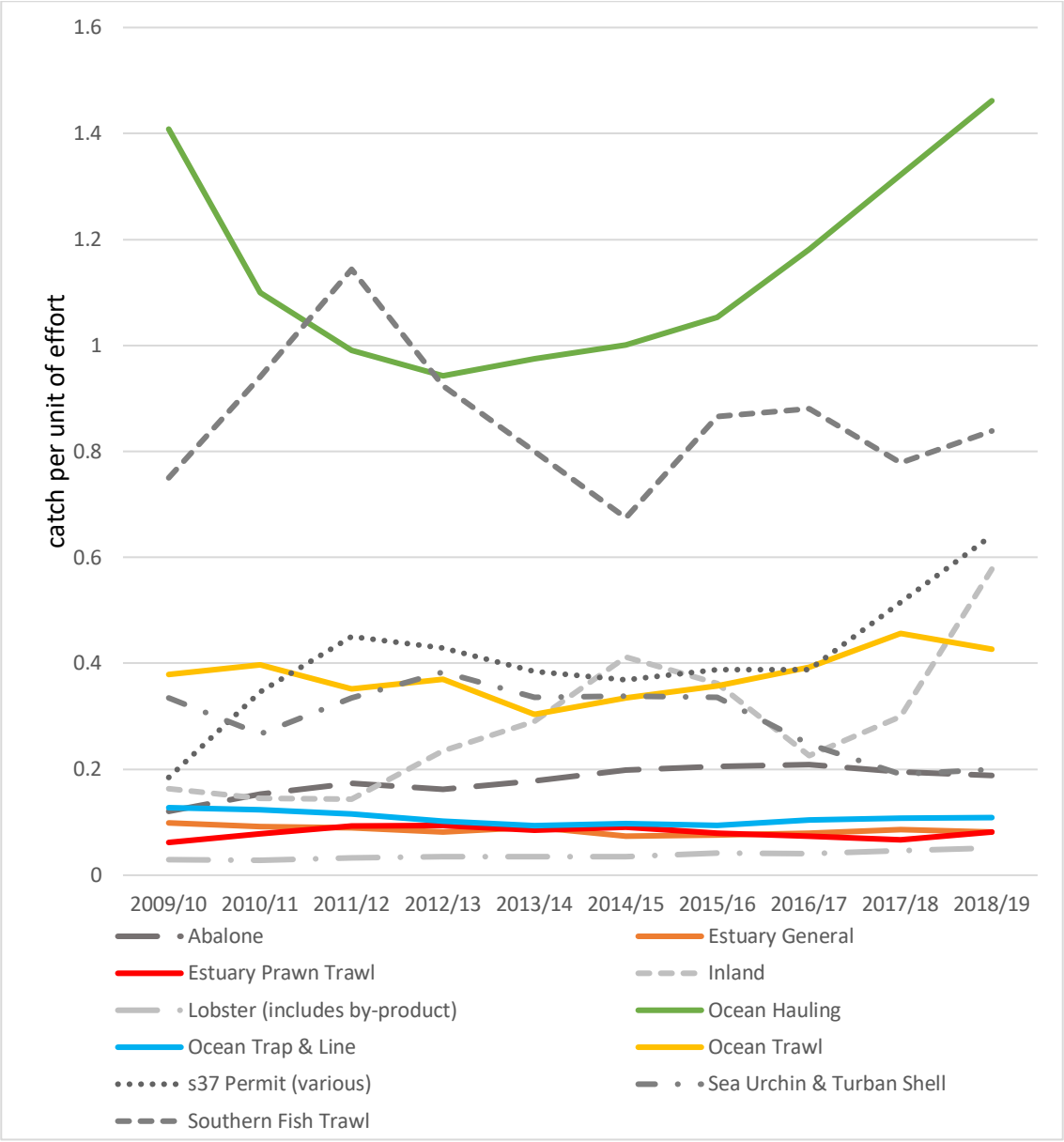


Figure 8. NSW commercial fisheries catch (reported tonnes gross landings) per unit of effort (no. fishing event dates reported) 2009/10-2018/19

Source: NSW DPI 17-12-19 extract.
Note: BAP fisheries are indicated by coloured lines, non-BAP fisheries are indicated by grey dashed lines.

The survey canvassed commercial fisher's perceptions of BAP impacts on the environmental sustainability of fisheries. A majority of respondents (81/151) report that the BAP has negatively affected the environmental sustainability of their fishery 'strongly' (55/151) or 'somewhat' (26/151). Many respondents (58/151), however, feel the BAP has had no environmental impact. Twelve respondents reported the BAP having a positive environmental sustainability impact on their fishery (Figure 9).

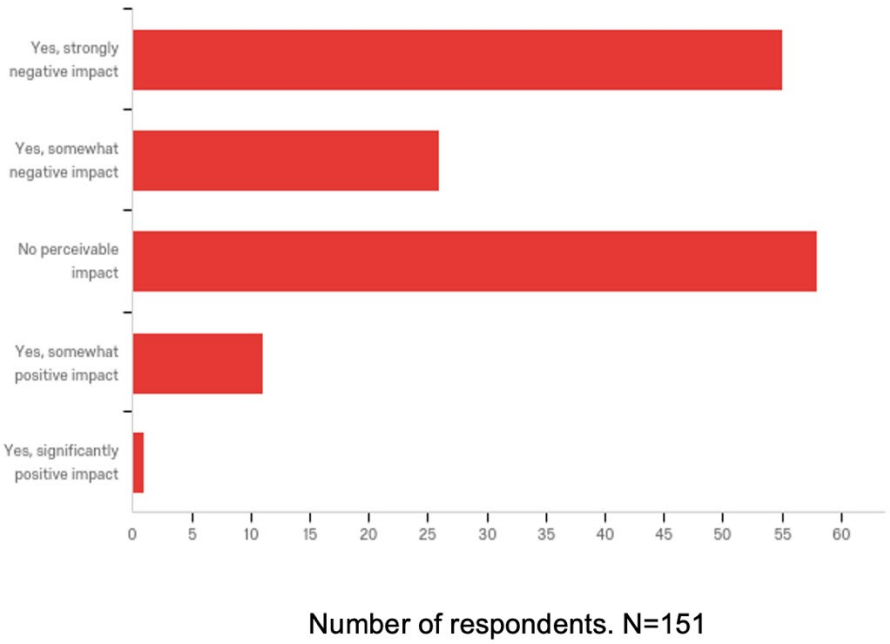


Figure 9. Survey Q40 How has the BAP impacted the environmental sustainability of your fishery, if any?

Research question: Has the BAP reduced the risk of latent capacity?
Answer: Latent capacity has likely been reduced through increasing minimum shareholdings in some fisheries in order to decrease the numbers of endorsements. Total numbers of entitlements in BAP fisheries have substantially declined between 2009 and 2019. Fishing business numbers show a decline from 2016.

One of the key motivations behind the BAP was to reduce the risk of overfishing posed by there being many little-used endorsements in fisheries, which if they were to be more used more could lead to overfishing (Stevens et al 2012). Introducing catch and effort quotas was intended to reduce the risk of latent capacity, and logically should, barring unanticipated influences.

One way to evaluate whether the linking of shares to catches/effort under the BAP has indeed reduced the latent capacity risk would be to see if the total numbers of endorsements per fishery have declined. Data held by DPI, however, does not clearly indicate the numbers of endorsements per fishery, making this analysis challenging. For example, licensed fishers may be eligible for endorsement but not have the minimum shareholding and fishers may hold more than one endorsement in a single share class due to the way their business is structured.

As far as we can see there is no existing data that would clearly indicate whether the latent capacity risk has been reduced in the BAP. We have therefore brought together three sets of existing data that shed some light on latent capacity, while noting their limitations as evaluations for this question. The first data set is total numbers of fishing entitlements per fishery in 2009 and 2019, the second is the number of fishing business owners, and the third is the percentage of fishing businesses reporting fishing activity.

Numbers of fishing entitlements
NSW DPI data on the total numbers of entitlements to fish in BAP fisheries indicates that probably there is less capacity now than there was before, because the numbers of entitlements in these fisheries have declined from a total of 3,799 in 2009 to 2,211 in 2019 (Table 10). Reductions in the numbers of entitlements does not clearly indicate reduced capacity because in 2009 entitlements were not linked to capacity.

Table 10. Numbers of fishing entitlements 2009 and 2019

BAP Fisheries share class group	**Entitlement totals 2009**	**Entitlement totals 2019**
Estuary General Category One Hauling (R1-7)	131	102
Estuary General Category Two Hauling (R1-7)	124	81
Estuary General Eel Trapping (R1-7)	164	94
Estuary General Hand Gathering (R1-7)	94	66
Estuary General Handline and Hauling (R1-7)	526	115
Estuary General Meshing (R1-7)	453	313
Estuary General Mud Crab Trapping (R1-7)	198	110
Estuary General Prawning (R1-7)	365	182
Estuary General Trapping (R1-7)	157	106
Estuary Prawn Trawl (Clarence, Hawkesbury, Hunter Rivers)	168	101
Ocean Hauling General Ocean Hauling (R1-7)	244	178
Ocean Hauling Garfish Net Hauling (R1-7)	49	23
Ocean Hauling Hauling Net General Purpose (R1-7)	112	61
Ocean Hauling Pilchard Anchovy and Bait Net Hauling (R1-6)	25	14
Ocean Hauling Purse Seine Net	14	15
Ocean Trap and Line (Demersal Fish Trap, Line fishing Eastern & Western Zones, Spanner Crab Northern & Southern Zones, School & Gummy Shark)	604	406
Ocean Trawl (Deepwater Prawn, Fish Northern Zone, Inshore & Offshore Prawn)	371	244
Totals	*3799*	*2211*
non-BAP Fisheries share class group		
Lobster	101	90
Abalone	34	35
Inland	26	26
Southern Fish Trawl - Southern Fish Trawl	23	23
Sea Urchin & Turban Shell	60	74

Source: NSW DPI data supplied 11 August 2020.
Note: Species quota share classes (eg Estuary General Mud Crab Quota) are not included in this table.

Numbers of Fishing Business owners

NSW DPI data on share ownership loosely indicates that probably there is less capacity in BAP fisheries (Estuary General, Estuary Prawn Trawl, Ocean Haul, Ocean Trap & Line, and Ocean Trawl) now than there was before, because the numbers of business owners in these fisheries have declined since the BAP was implemented (Figure 10). Reductions in the numbers of owners does not necessarily mean latent capacity risk is reduced, and the risk could be reduced without the number of share owners changing, but this is one potential indicator.

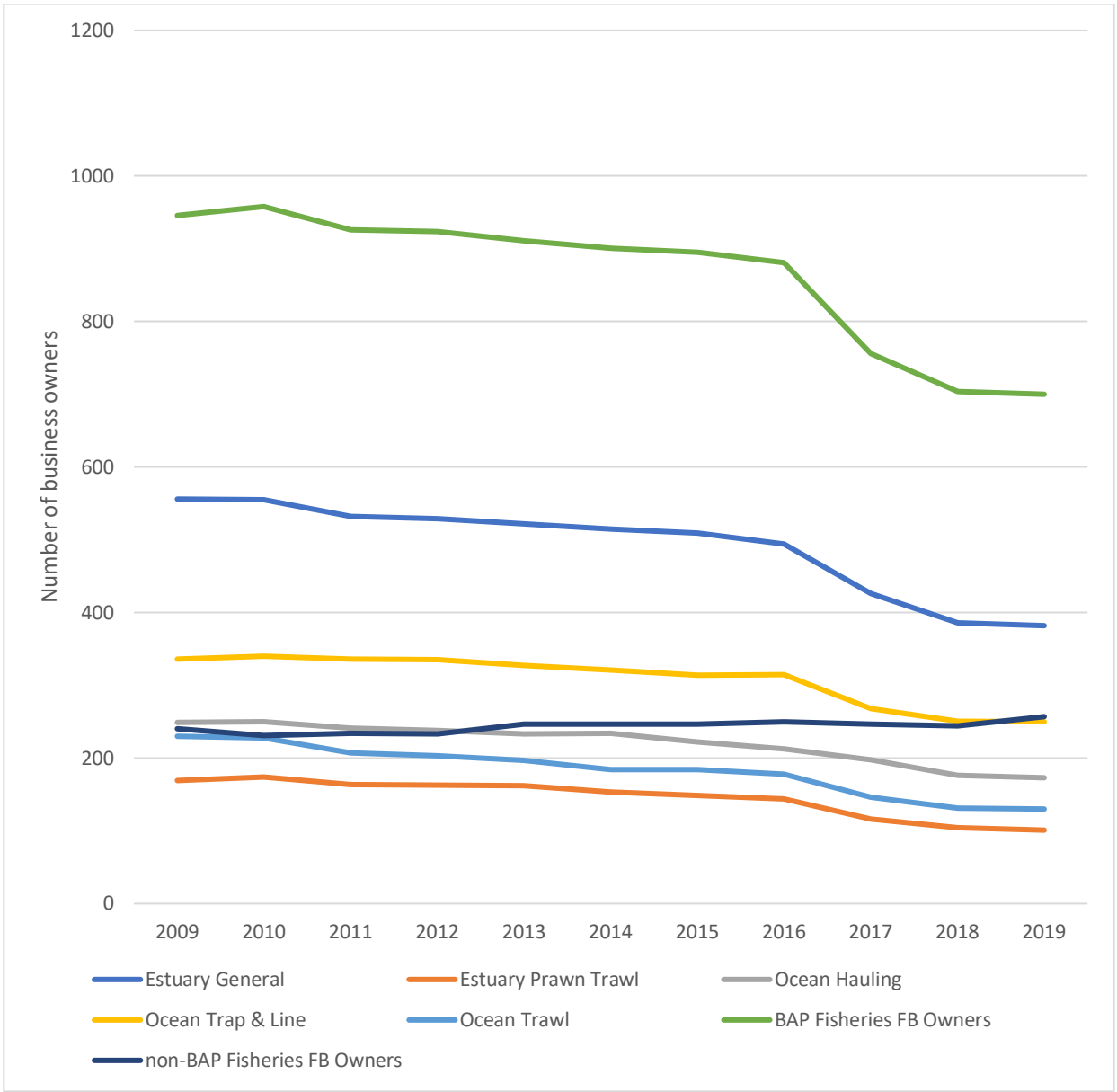


Figure 10. Numbers of Fishing Business (FB) owners 2009-2019

Source: NSW DPI 17-12-19 extract, ongoing validation may alter this information.
Notes: Numbers of Fishing Business owners was calculated by registration number. Some owners have more than one Fishing Business. Many businesses hold shares/endorsements in more than one fishery. Certificates extract date was 1 July each year, except 2019 when date was 1 February 2019.

Percentage of fishing businesses reporting fishing activity

A second way to see if latent capacity has reduced is to look at the businesses reporting fishing activity as a proportion of total fishing business – on the assumption that the latent capacity was possibly sitting with the fishing businesses not reporting fishing activity, and that requiring businesses to pay for shares in the BAP might have reduced the numbers of fishing businesses not reporting fishing activity. However, the BAP has not had a noticeable effect on the percentage of fishing businesses reporting activity (Table 11).

Table 11: Commercial wild catch Fishing Businesses (FB) total numbers and numbers reporting fishing activity 2009/10-2018/19

Year	Total FB	Total FB reporting fishing activity	Percentage
2009/10	1298	1029	79%
2010/11	1274	1060	83%
2011/12	1284	1048	82%
2012/13	1302	1027	79%
2013/14	1302	1021	78%
2014/15	1303	994	76%
2015/16	1306	965	74%
2016/17	1130	934	83%
2017/18	1088	841	77%
2018/19	1101	829	75%

Source: NSW DPI 17-12-19 extract, ongoing validation may alter this information
Note: the numbers are as at the end of the fiscal year.

ToR 1.2.3 Viability: Ability to respond quickly to changing conditions by having access to different fisheries

As noted above, before the BAP there were many fishing rights not being fully used in NSW commercial fisheries, and these were seen as a latent capacity risk. The practice of keeping fishing rights but not using them to their full extent arose for several reasons. For the purposes of this analysis the key reason is related to fluctuations in environmental conditions in NSW fisheries, particularly estuarine fisheries. In times of drought, high rain, varying seasons and different water temperatures and currents some fisheries work while others do not, so historically fishing businesses have managed by shifting across different fisheries as conditions change (market conditions are also an influence). This means many businesses had a diversity of fishing rights, including in fisheries they rarely used, which helped with business viability during the times other fisheries were not working.

Discussions with stakeholders during the research design phase of this evaluation revealed that there is a paradox between the latent capacity risk that could threaten the viability of fisheries, and the need to have rights in a diverse range of fisheries to maintain viability in changeable estuarine fisheries. As one stakeholder asked us: *What is a viable fishing business? Is a rarely used eel license that helps carry a multi-species and multi-gear fisher over droughts not a viable business, or does it help keep that fishing business viable?* The BAP, by requiring fishers to pay for minimum shareholdings to be able to fish commercially at all, potentially made it more difficult to pursue the portfolio approach to fishing in NSW.

Research question: Has the commercial fishing Industry retained diverse shareholdings?
Answer: The available data indicate diversity of shareholdings across fishery share class types has reduced since 2016. Investigating whether fishing practices are in fact less diverse and if so why was beyond the project scope. Given stakeholder assertions that the generalist fisher business model requires flexibility in responding to fishing and market conditions, diversity of shareholdings should be monitored as part of understanding Industry viability.

One of the concerns about the BAP expressed by stakeholders was whether the BAP would enable fishers to remain diversified; operating across multiple fisheries. The ability to switch from one fishery to another in response to current environmental and market conditions has been noted as a factor in the viability of NSW commercial fisheries.

The way we answered this this question was through using DPI data on shareholdings to look at the number of different types of fishery shares held by individual fishing businesses. We assume that if the BAP enables fishers to retain diverse shareholdings then the numbers of types of shareholdings per business will hold steady. Conversely, if the BAP is forcing fishers to specialise, then there will be reduced numbers of types of fishing share class per fishing business.

Figure 11 suggests that the BAP is causing fishers to specialise, in that there is reduced diversity in the types of fishing in which Fishing Businesses have rights. Further research would be needed to see if this does indeed affect business viability for multigear, multispecies estuarine fishing businesses.

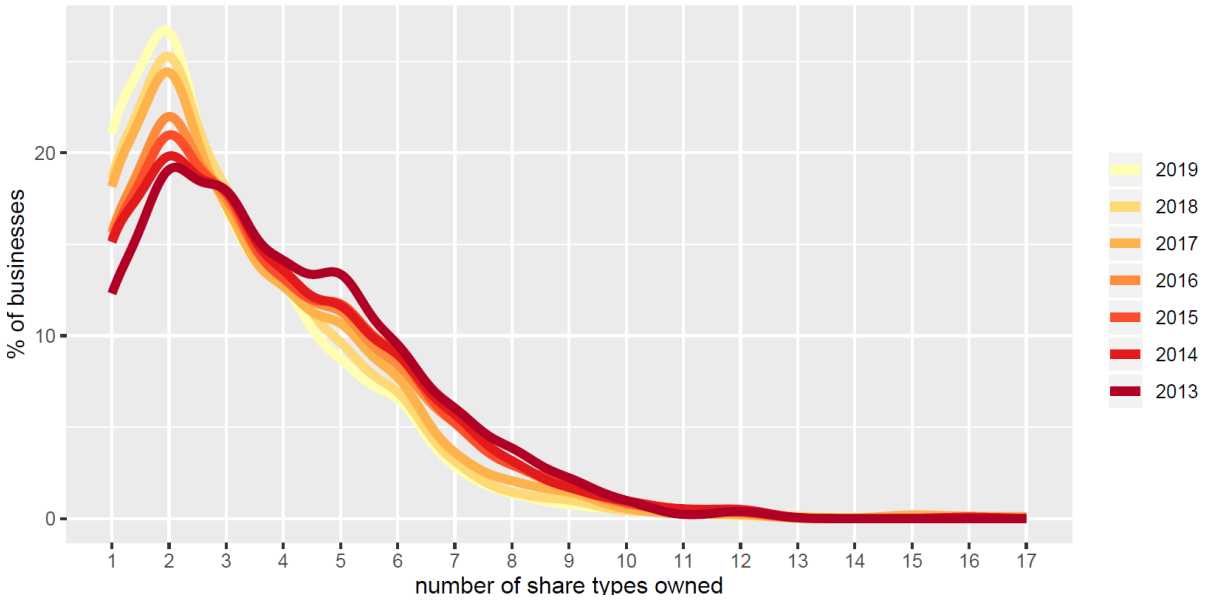


Figure 11. Number of access share class types owned per Fishing Business Number, 2013-2019

Source: DPI share ownership data, 2013-2019
Notes:

- 'Share classes' here refers to units such as 'Estuary General Handline Region 2' and 'Ocean Trap and Line Spanner Crab Northern Zone'.
- Only share classes from the five BAP fisheries have been included in this analysis. Rock lobster and Abalone are not included.
- We have included only access shares and not effort or species quota shares in this analysis. This is because the introduction of quota shares in the BAP meant many new share types were created, so analysis across the pre- and post-BAP period would contain more share types even if fishers are only as diverse in their practices as they were before, or possibly if they were less diverse in practice. If the analysis is repeated periodically after the BAP reforms to share types

have settled, the observable trends will be a more reliable reflection of fishing practices in future analyses.

ToR 1.3 Value

ToR 1.3.1 Value: Dollar value of businesses, and of fishery shares

Research question: Has the BAP improved the monetary value of fishery shares or of fishing businesses?
Answer: There is no reliable available objective data to assess any changes in the monetary value of fishery shares or fishing businesses. Survey responses are mixed on this topic, but some say their business value has increased.

In instituting ITQs and ITEs in BAP fisheries the dollar value of shares and fishing businesses should improve. There is, however, no objective data available by which to evaluate whether dollar values have in fact improved. DPI data on share ownership and share transfers allows fishers to record the value of transfers, but does not require it, so many fishers provide no information or clearly false information on the value of share transfers. We were unable to find systematic information on sale values of fishing businesses.

Some respondents in the online questionnaire survey left text comments on the effects of the BAP on their business value:

> *[W]ith the introduction of quota, the market prices have stabilized and increased with demand, creating a work smarter not harder mentality, less of the dumping of bulk product on the market floor that returned low prices, cost to produce were always the same. Quota has benefited fishers with better prices, there is ab[ility] to earn a decent living with less shares.*
>
> *Income is down but overall value of business is up.*
>
> *I could see the business growing. Happy workers now, and I now know future.*
>
> *Life was easier in 2014 however my focus for my business is much clearer [now].*

ToR 1.3.2 Value: Non-monetary values of wellbeing and satisfaction with business/work among business owners and fishers

Research question: Has the BAP improved business satisfaction?
Answer: Cannot yet be determined. Most survey responses indicate poor business satisfaction.

The BAP has not yet caused a majority of fishing business owners to be satisfied with their businesses. Survey respondents recorded very low levels of satisfaction with the way their business was going at that time (September–November 2019) (see Figure 12).

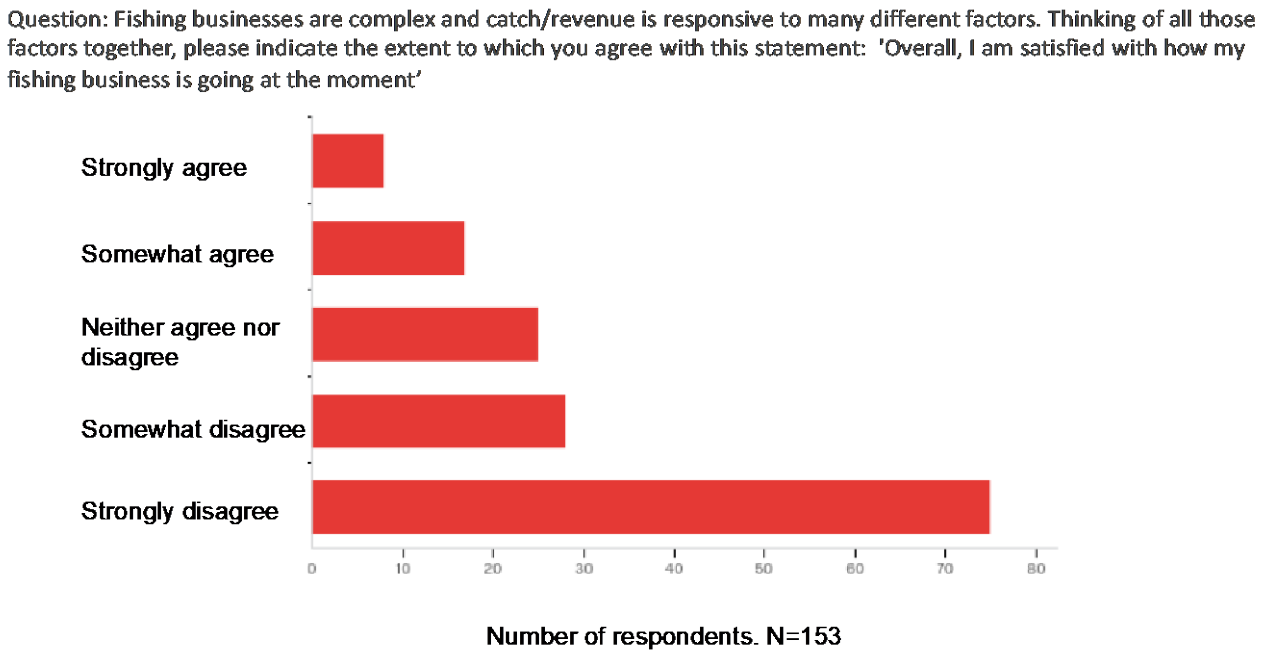


Figure 12. Survey Q33 on current business satisfaction

There is no pre-BAP comparison data for business satisfaction. It would be useful to monitor business satisfaction every few years as part of the ongoing social and economic monitoring of NSW commercial fisheries.

Research question: Has the BAP improved wellbeing among fishing business owners and fishers?
Answer: Not yet. Most survey respondents report that the BAP has reduced their satisfaction with life. Reported life satisfaction among commercial fisher respondents is noticeably lower than that reported by rural residents in Australia generally, as is reported wellbeing in all domains of life. Reported satisfaction with the safety domain of life is particularly low.

For the life satisfaction questions in the survey we used an existing widely-used tool – the Personal Wellbeing Index (PWI) (International Wellbeing Group 2013). The PWI asks about satisfaction with several domains of life and is often preceded by a single question about satisfaction with life overall (Global Life Satisfaction, GLS). As per the tool developer's recommendations we asked the GLS question first, before then asking respondents about the domains of life. We slightly modified the tool, in that we omitted one of the seven questions normally included in the PWI on satisfaction with 'your future security'. This question was felt by stakeholders during our survey design phase to be confusing and unnecessary in the context of our fisheries survey.

Using a validated tool rather than inventing our own questions makes the findings more reliable, and also enables the survey results to be compared with other surveys using the same tools. In particular, it enabled us to compare life satisfaction of NSW commercial fishers with the life satisfaction reported for rural and regional communities in Australia as a whole (Schirmer et al. 2016).

Most survey respondents report that the BAP has reduced their satisfaction with life (Figure 13).

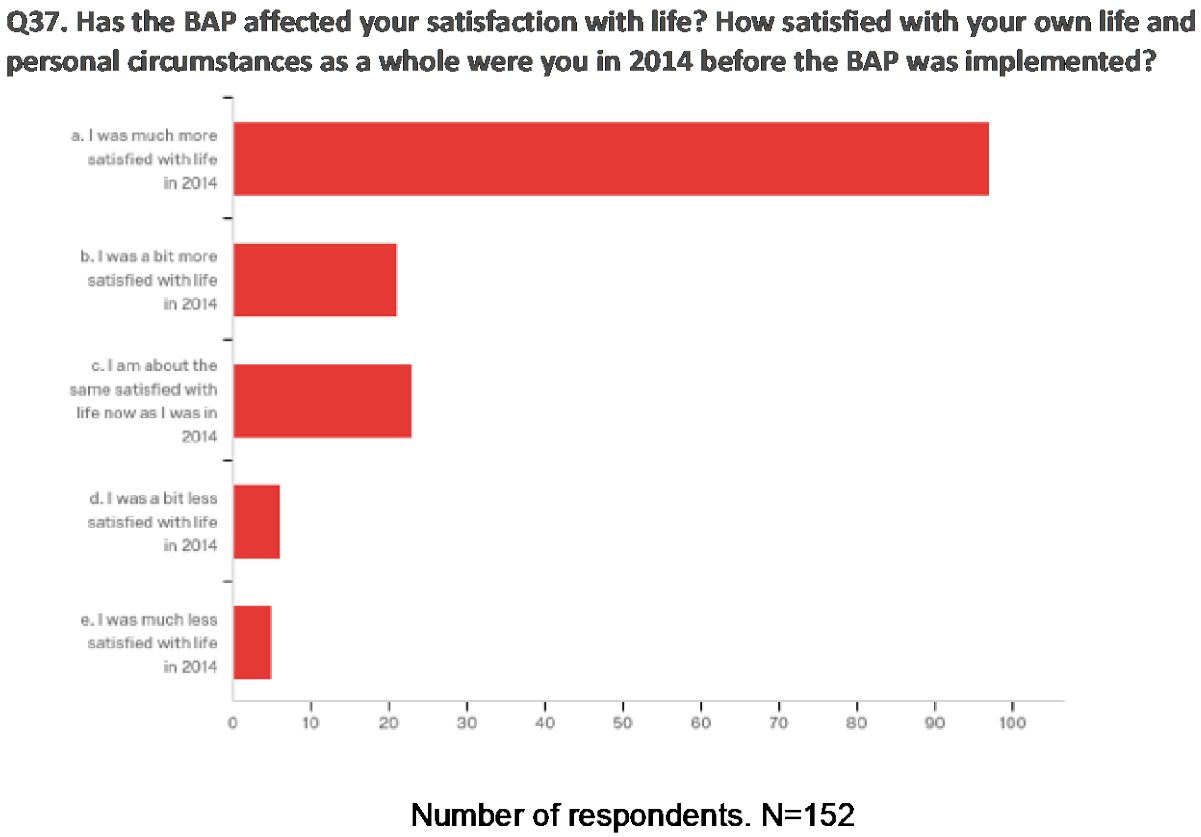


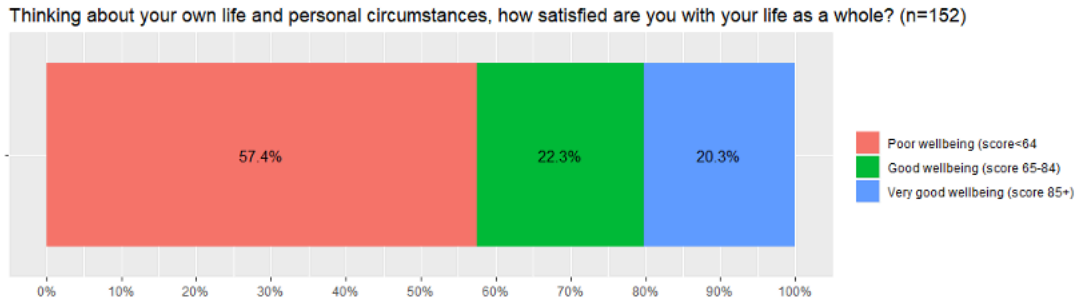
Figure 13. Survey Q37 results

The results of the survey show worryingly low life satisfaction among NSW commercial fishers – much lower than is reported by people living in rural and regional communities in Australia as a whole (Schirmer et al. 2016). The results of this survey resonate with the results of another study of the health and wellbeing of Australian fishers which found: 1) commercial fishers have higher levels of psychological distress than Australians as a whole; 2) the second most commonly reported reason for poor wellbeing among commercial fishers is regulatory burden, including uncertainty from changes and perceived lack of fairness; and 3) the top source of stress reported by fishers was related to changes in government regulations regarding access to fishing and red tape (King et al. 2019).

It is possible that the life satisfaction responses in our study were influenced by being part of a survey about the BAP, because the majority of respondents had negative feelings about the BAP. It is, however, unlikely that the context factor fully accounts for the poor wellbeing reported by NSW fishers. Low wellbeing among NSW commercial fishers caused by a mix of factors, one of which is government regulation, has been raised several times over the last decade including in two government inquiries (NSW Government 2010; NSW Legislative Council 2017a).

We asked participants to rank their satisfaction with their life as a whole (GLS), and then with various domains of their life (PWI).[6] A relatively large set (42.6%) report good to very good satisfaction with life as a whole (GLS), despite the negative perceptions expressed elsewhere in the survey. The overall reported wellbeing for NSW commercial fishers in this survey, however, is significantly lower at 5.6 than is reported for rural and regional communities in Australia, at 7.1 (Schirmer et al. 2016, p.25) (Figure 14).

[6] The single Global Life Satisfaction question and the set of questions about satisfaction with domains of life are both based on a validated, widely used tool, the Personal Wellbeing Index (International Wellbeing Group, 2013).

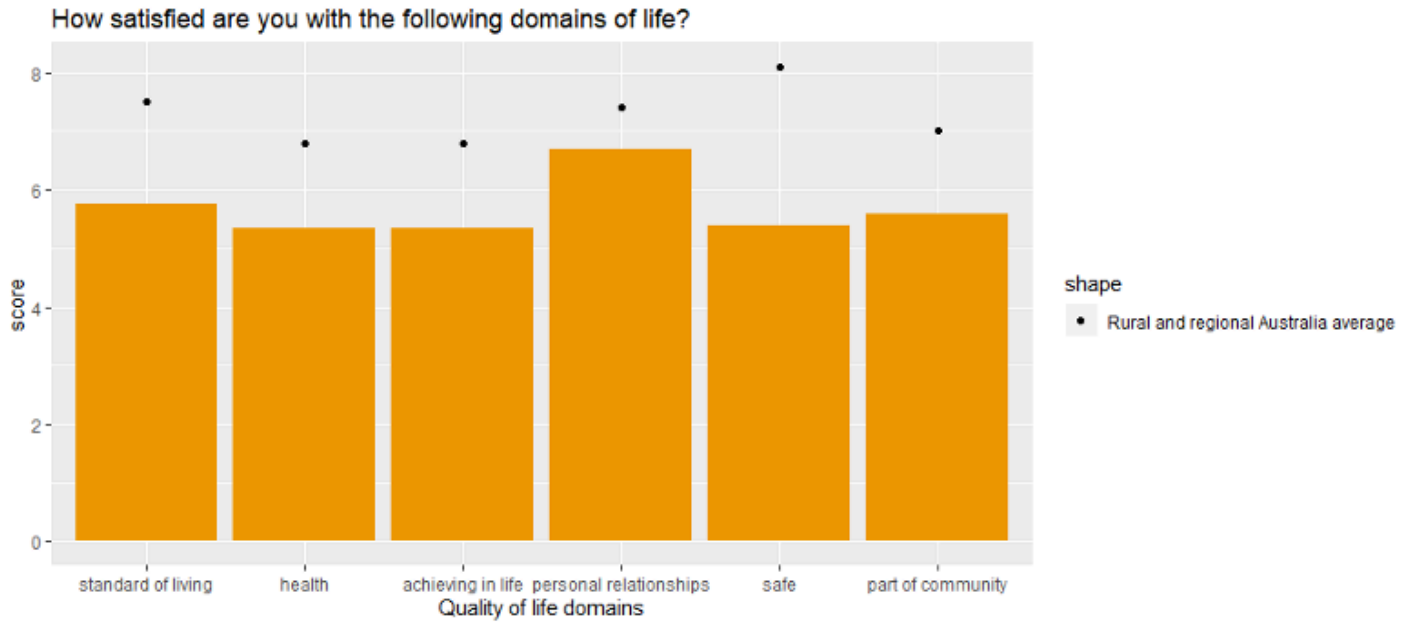


Global Life Satisfaction (GLS) score by industry status groups

Rural Avg. (2015)	Survey Avg. (2019)
7.1	5.6

Figure 14. Global Life Satisfaction scores

NSW commercial fisheries respondents also scored much lower than people in rural and regional Australian communities on each of the questions in the Personal Wellbeing Index (PWI) (Schirmer et al. 2016, p.44). The worst score is for the question about safety, which could relate to text comments about the introduction of effort quota (limiting the number of days fishing is allowed) causing people to work extremely long days, even 24 hours. Low reporting of wellbeing on how safe respondents feel could also relate to the commercial industry having high rates of accidents (Brooks et al. 2019) The gap between rural and regional Australians as a whole and NSW commercial fishers is even greater on the safety question than it is on the others (Figure 15).



	Standard of living	health	achieving in life	personal relationships	safe	part of community
Rural Average (2015)	7.5	6.8	6.8	7.4	8.1	7.0
Survey Average (2019)	5.8	5.3	5.3	6.7	5.4	5.6

Figure 15. Personal Wellbeing Index scores

Note: The full wording for quality of life domains: your standard of living; your health; what you are achieving in life; your personal relationships; how safe you feel; feeling part of a community.

According to a majority of respondents, the BAP has reduced their satisfaction with life, with 98/152 saying they were 'much more' satisfied with life before the BAP was implemented, and 21/152 saying they were 'a bit more' satisfied with life before the BAP. Four respondents said their life satisfaction has improved greatly, and six said it has improved slightly since 2014, with 23 saying their life satisfaction is 'about the same' as it was in 2014 (see Appendix 5, Q37).

Fifty-six respondents added open-ended text comments to the question about the impact of the BAP on their life satisfaction. Many commented on the stress and anxiety the BAP process caused, over a period of at least four years for BAP-affected fisheries and longer for some. Some reported that the BAP had caused mental health problems such as depression. Some quotes that illustrate this we the following:

> *The stress and anxiety that the whole reform caused my family was immense.*
>
> *I lost a third of my business and got nothing back in trading. [I am] really struggling now. I have never struggled in 40 years of fishing, but I am now. The depression is the hardest part.*
>
> *Our fishery had been in limbo for so long, with no direction, Governments changing and Ministers promising to restructure, with every change of government. In our [species name] fishery [we waited] 16 years. We were told we were to go to quota around the year 2000… then again after 2007 when the shares were allocated, [the] Labor Minister signed a letter in 2009 to proceed with quota. Government changed, again Liberals did a review agreed that the fishery should go to quota to help preserve the stocks, took until 2015 to happen. Yes, I feel better that the decision was finally made and completed, so we now have a clearer understanding of how we can personally move forward. Quota didn't happen until 2015, before this was like living under a dark cloud of uncertainty. Do I feel better now, yes, four years later improved stocks and prices. Looking forward now.*

ToR 1.4 Potential trends under a 'without intervention' scenario

The viability of businesses within the NSW fishing Industry was assessed in 2015 by a specific study of the Industry in respect of the reform process (AgEconPlus 2015) and under a wider social and economic review project which reported on Industry economic viability in 2012-13 period (Voyer et al. 2016). The Industry was found to be 'input-controlled and with considerable excess capacity' with negative rates of return on investment for both fishers and the fishery confirming previous historical studies. These authors commented that 'establishment of tradeable property rights such as through the Linkage of Shares to access, effort or catch can aid in the removal of excess capacity and improvement in financial and economic returns to individual fishing businesses and fisheries as a whole' (AgEconPlus 2015, p.4). The Voyer et al. (2016) economic business survey showed significant economic under performance in Estuary General and Estuary Prawn Trawl, with businesses from the other share class groups being just viable in a limited sample.

The indications from these previous reports, and the background information collated for this report, show that a 'without intervention' scenario would have been a continuation of low and/or deteriorating economic performance and uncertainty in business for commercial fishers. It is possible poor economic performance could then have led to biological overfishing in the long term.

ToR 1.5 Discussion on impacts of the BAP with regard to the Fisheries Management Act (1994)

The objects of the Fisheries Management Act (1994) are listed below, with the most relevant parts for this evaluation in italics.

> (1) The objects of this Act are to conserve, *develop* and share *the fishery resources of the State for the benefit of present and future generations*.
> (2) In particular, the objects of this Act include – (a, b, c – regarding ecology and conservation) and, consistently with those objects – (d) *to promote viable commercial fishing* and aquaculture *industries*; (e) (regarding recreational fishing); (f) (regarding sharing resources among user groups), and; (g) *to provide social and economic benefits for the wider community of New South Wales*, and; (h) (regarding Aboriginal cultural fishing)

It is worth noting that the more social and economic objects of the Act (d-g) are listed underneath and must be consistent with the biodiversity conservation objects (a-c). The work of Government, therefore, is primarily concerned with the ecology and conservation objects of the Act. However, the BAP was more centrally concerned with economic factors, and ecological sustainability questions were not included in the Terms of Reference, so this evaluation does not focus on those objects of the Act.

To conserve, develop and share the fishery resources of the State for the benefit of present and future generations

According to the evaluation conducted within the scope of this study, and existing reporting on the biological status of NSW fisheries, fishery resources were being conserved, and the BAP has probably improved this, through reducing the risk that latent capacity could cause biological overfishing. The topic of developing the fishery resources is discussed below, in the topic of promoting viable commercial fishing industries. The topic of sharing fishery resources of the State between different types of resource users is out of the scope of this project.

Regarding 'benefit of present and future generations', the BAP does seem to have introduced some intergenerational inequity into fisheries. As part of the BAP process many fishers have incurred commercial debt. Access to capital to buy shares thus became an issue for older fishers and new entrant younger fishers, who were less able to satisfy bank requirements regarding business track record and serviceability for finance, limiting their capacity to purchase shares. The introduction of low interest rate loans via the Rural Adjustment Authority (RAA) was a mitigating action, but it is not clear whether it fully resolved the intergenerational inequity posed by the BAP.

To promote viable commercial fishing industries

The BAP was intended to improve the viability of the commercial fishing Industry. Restriction of fishery access in the form of ITQs and ITEs aimed to increase effective resource management and improved economic outcomes through a rights system that would enable Industry to undertake more autonomous business and share adjustment with less requirement for Government intervention.

The potential of government intervention to negatively affect the viability and wealth of fishing businesses when changing fishery management arrangements is recognised in Commonwealth fisheries (AFMA 1997). The BAP use of the SARC and IAP processes sought to minimise viability impacts. The issues relating to security of access to resources and commercial viability discussed above at ToRs 1.1 and 1.2 show that there were some areas in which the NSW Government could have done more to prevent impacting commercial viability and the wealth of fishing businesses through the BAP.

Since stock sustainability is important for a viable commercial fishery, in designing the BAP it would have been desirable to have specified how the BAP would meet accepted longer term sustainable fishery management goals, such as the effort and catch settings associated with maximum sustainable yield (MSY) or maximum economic yield (MEY). As far as we are aware a bio-economic analysis or consideration of long run supply scenarios was not undertaken.

Prior deciding on the form of the BAP the envisaged reforms should have had projected estimates of the desired level of commercial viability and the resource rent (profitability) potentially available from the fisheries under the proposed revised management arrangements. This would have required some economic modelling and both the projections and modelling would have been useful in measuring the success of the reform afterwards. The economic analysis prior to the BAP consisted of an assessment of 'impacts of share linkages' (Cartwright et al. 2015), an estimate of the estimated profitability of fishing businesses within the NSW Industry at the time of the reform (AgEconPlus 2015) and an independent review of the NSW Government's approach to implementing the SSTM by an independent academic specialising in auction design (Bichler et al. 2019). However, these together did not constitute an economic cost benefit assessment of the proposed BAP program, alternatives and their impacts.

> *The difficulty in estimating financial impacts have been raised by the independent economic study commissioned by the SARC, and acknowledged by recent analyses conducted on behalf of NSW Seafood Industry Council and the Sydney Fish Markets. Further, Industry submissions in response to the SARC's draft recommendations demonstrated that even owners of Fishing Businesses had difficulty in estimating the likely financial impact on their business in a meaningful way.* (Cartwright et al. 2015, p.4)

A cost benefit analysis could have included predictions of scenarios flowing from different adjustment options. It would have been useful to have an explicit analysis of the costs and benefits of requiring the Industry to fund the reform to the extent they have as revealed in the analysis at ToR 1.2.1 on viability. It seems that requiring fishers to go into debt to buy shares in not-very-profitable fisheries has damaged the viability of commercial fishing in NSW in the short term, and it would have been good to compare this approach with an alternative approach that required less investment by Industry in the short term.

While the BAP was intended to improve viability through introduction of property rights in the form of ITQs and ITEs, the BAP simultaneously undermined those rights through forcing fishers to buy shares to maintain their existing levels of business, as discussed above in relation to ToR 1.1 on security of access to the resource. This aspect of the implementation of the BAP has led to a great deal of mistrust of Government by Industry. As one survey respondent put it:

> *Why should I have had to buy my job back in a sustainable fishery?*

To provide social and economic benefits for the wider community of New South Wales

The main way commercial fisheries can provide social and economic benefits to the wider community is through being viable, profitable businesses in regional areas, providing employment and fresh local seafood, which complements the important coastal tourism sector (Voyer et al. 2016). The analysis possible within the scope of this project show that the BAP has not improved these kinds of benefits (see the discussion at ToR 2.2), possibly due to the Industry still being in the period of adjustment, with viability and profitability not yet improved at the Industry level. If profitability improves in future, these benefits may increase.

Another way commercial fisheries can provide economic benefits for the wider community is through paying back to Government a community contribution in respect of their use of a public

resource (wild fish) as the basis of their business. Under the Act s77 makes provision for a community contribution:

> *Shareholders in a share management fishery are required to make a periodic contribution for their right of access to the fishery (a community contribution).... payable after the commencement of, and in accordance with, the management plan for the fishery*

A community contribution has been implemented in the NSW Abalone and Rock Lobster fisheries in respect of their fishery access and sustainable resource rents generated by the fishery.

The analysis of the costs of incurred by Industry to buy shares in the BAP presented in the section on ToR 1.2.1 show that Industry has contributed around $21.48m, some of which was funded by commercial debt, some funded by concessional debt via the RAA and some funded by savings, which incur opportunity costs. If $10m of the BAP investment was funded by commercial debt, interest of between $500,000 and $800,000 per annum is now being paid to the commercial banks. This debt servicing reduces the capacity of Industry to potentially pay a community contribution. This object of the Act, therefore could potentially have been better served if the BAP had not required fishers to go into debt to banks with interest payment servicing to finance the reform, but had first enabled profitability improvements, and required a community contribution as a return to NSW as envisaged under the Act.

ToR 1.6 The effectiveness of existing governance and consultation processes in facilitating consultation and communication between Government and Industry

This ToR was not included the original schedule of works for the project contract, but was introduced after work had started on the project. A thorough evaluation of governance, consultation and communication between Government and Industry was beyond the scope of the project. Commentary presented in this section is largely based on the open text comments provided by respondents to the online survey, and is concerned with the BAP. Further work would be needed to identify what are the existing governance and consultation processes and evaluate how effective they are at facilitating consultation and communication between Government and Industry.

Consultation was not effective in 'bringing Industry along' with the BAP

The documents on the DPI website showing the history of the BAP (NSW Government 2019) detail that extensive effort was put by DPI into consultation about the reform over a period of many years. Unfortunately, however, the evidence presented at the Parliamentary Inquiry in 2016 and online survey responses for this study indicates that many fishers failed to be convinced that the BAP was good policy. This reflects finding by other researchers that paradoxically as consultation has become more embedded in government policy over recent decades, decision-making has had declining legitimacy and stakeholders feel less engaged (Fudge, 2018). In an evaluation of commercial fisheries stakeholder engagement for the Queensland Government we found that improved engagement may require structural reform in fisheries management – enabling fishers to play a more significant role in governing their sector through co-management (Barclay et al. 2019).

Perceived unfairness in share allocation process
The process of linking catch/effort to shares in the BAP is one of the most contentious aspects of the BAP. Initial allocations in quota managed fisheries are usually contentious, so a certain level of contention would be expected. However, the complex administrative history, diversity of fishing activities, small-scale nature of most of them and varied interests meant quota allocations in the BAP were unusually contentious, with widespread perceptions of inequity arising in Industry. The complexity and reasons for some Industry people feeling the share allocation process was inequitable are outlined in the discussion on ToR 1.1 (Security).

The BAP and Aboriginal fishers
Three of the survey respondents mentioned a new resource conflict problem that has arisen with the BAP. According to these three respondents, Aboriginal fishers have been allowed to continue some of their fishing without meeting the same requirements as non-Aboriginal fishers. Only a very small number of respondents raised this issue, and it was beyond the scope of this project to investigate their assertions further. It should be noted that given the history of dispossession and past injustice, and the fact that Aboriginal commercial fishers were identified as being likely to 'lose out' in the BAP (Schnierer and Egan, 2012), differential treatment of Aboriginal fishers may indeed be good public policy. If this occurs without non-Aboriginal fishers being aware of the reasons for it, however, and gives rise to resentment among non-Aboriginal fishers, that would be a problem. Because of the importance of commercial fishing as a livelihood and way of working on Country for Aboriginal people in coastal communities in NSW (Schnierer and Egan, 2016), the authors highlight this point as worthy of further investigation.

Comments on governance of the Subsidized Share Trading Market (SSTM)
The SSTM was an innovative approach to enabling fishers with different shareholdings to buy or sell in a framework where a government subsidy could be used to reduce the amounts paid by fishers. The system had an algorithm-based method of matching and selecting bids in each 'round'. This took time for the system to match bids to optimise outcomes and led to a delay for the fishing business knowing whether their bid had been successful. This model limitation impacted the capacity of a fishing business to make further purchase transactions to efficiently position itself – an important characteristic in a real market. This 'combination' issue had been considered in the design so as to be as equitable as possible, but had an efficiency limitation (Bichler et al. 2019). The use of the model 'saved the taxpayer A$3.4 million' (Bichler et al. 2019, p. 787).

The SSTM was web-based, administratively complex, and required all participants to have sufficient information and computer literacy to make transactions effectively. Although the Department provided fishers with assistance for the SSTM, given the low levels of formal education and computer literacy among commercial fishers, questions remain about the equity of outcomes from the SSTM. Since there was conventional trading of shares going on outside the SSTM, the survey responses indicate that some fishers who had difficulty understanding or using the SSTM instead traded outside the SSTM and thus missed out on the subsidy.

Text comments in the survey also revealed that some fishers faced great difficulties with the way the SSTM was managed. Although the SSTM was an innovative way to allocate subsidies to ease the adjustments businesses needed to make to fit with the new regime, many survey respondents report being unable to adjust as they wanted. Many of the complaints were about problems with information about the number of shares that would be available for fisheries in the SSTM, or what prices they would be (the extent of the subsidy). Some respondents accused both DPI and other fishers of deliberate wrongdoing in the SSTM. Some respondents mentioned problems about information necessary for trading coming at the wrong time, or information being changed during the process. It is beyond our expertise and the scope of the project to assess these claims, we can only note here that such claims were made by respondents in the survey.

The Subsidized Share Trading Market was a disgrace. To put it into simple language we were lied to. There was no transparency whatsoever before during or after.

It was either buy more shares or get out with $20,000 for 35 years' work.

I bought all shares that were actually available to purchase on the share market, and I am still below my former operation in that share category by half, and that has stretched us to our limits financially.

The BAP has destroyed my business viability and its value. Impossible to adjust main part of my business because was faced in Round Two with bidding over $200,000 to do tomorrow what I did before. I was unsuccessful in receiving the shares that I needed in [two species] because the government lied to me. Told all fisherman those with high deficit (those 20% that caught 80% of the catch) would be no. 1 priority in the Share Trading market. In the BAP I lost 80% of my income overnight and then in second phase [share class type] lost 95% of income from that endorsement from 1st July 2019. Sold nothing, was offered $20 in Round Two for [share class type]. Found out 18 months after the market closed that most of the shares I needed in my prime endorsements had sold before the market. I was led like a lamb to the slaughter.

I was grossly misinformed by the BAP hotline that the shares I required were not going to be part of share trading because it was already a quota fishery.

Mud crab and the BAP

Open text comments left by respondents in the online survey included many complaints about how the BAP unfolded in the Mud crab trap fishery. A lexicon search of the survey data show there were more comments about mud crab in the survey than about other species. Examples quotes of dissatisfaction include:

I know that the Mud crab and trapping shares were simply not there [in the SSTM]– they were [sold] before the market and [fishers] were not advised.

My business is not remotely like it was before the BAP. There are now unprecedented amount of traps in the water chasing Mud crabs. There is no longer any code of conduct in the river… Share investors with multiple fishing businesses and huge amount of quota shares chasing Mud crabs now have a monopoly with the sheer amount of traps they have in the water.

In the year before restructure most of my income was from Mud crabbing and I caught 3500kg that year with average annual catch around 1500kg. I am now subject to quota of just over 700kg so this has had huge financial impact on my business. I have had to diversify to make up for the lost income from Mud crabbing.

Terms of Reference 2: Social and economic monitoring - survey

For details on design and implementation of the survey see section above: Methods, data and limitations.

ToR 2.1 Survey four groups of interest

The Terms of Reference specified that four key groups of interest should be identified in the survey. These are people who responded to the BAP by the following ways:

1) entering the NSW commercial fishing Industry (meaning they bought their first commercial fishing business);

2) exiting the Industry through selling or surrendering their fishing business and associated shares;

3) continuing or adjusting their fishing business through trading shares; and

4) not engaging with the Government's Subsidized Share Trading Market (SSTM). The numbers of participants corresponding to each of these four groups is set out in Table 12.

Table 12. Survey respondents in 4 groups of interest

DPI category of interest	Question in survey	%	#
1) New entrants	I entered the Industry by buying my first commercial fishing business*	5.63	8
2) Exited the Industry	I left the commercial fishing Industry by selling or surrendering my business(es)*	12.68	18
3) Adjusted their business	I continued in the commercial fishing Industry much as before, or through adjusting my business	50.70	72
	I continued in one or more of my fisheries, but exited one or more of my fisheries	30.99	44
4) Did not engage in the SSTM	Answered 'no' to: Did you trade in the Subsidized Share Trading Market?	39.74	62

* See also Table 16 showing how many survey participants have entered the NSW commercial fishing Industry since 2014, or have exited in the last five years.

Respondents in the project online questionnaire survey who reported best life satisfaction and wellbeing across all domains of life were those who have exited the commercial fishing Industry. Open text comments provided in the survey indicate that reduced workload and stress as well as Government assistance with subsidies and buyouts contributed to this group having higher wellbeing. The groups of respondents who reported poorest life satisfaction and wellbeing were new entrants to the commercial fishing Industry, and those who did not engage with the SSTM.

Question: We want you to think about how the NSW Government's commercial fisheries reform in the Business Adjustment Program (BAP) affected the way you run your fishing business. Overall, what kind of impact has the BAP had on your business?

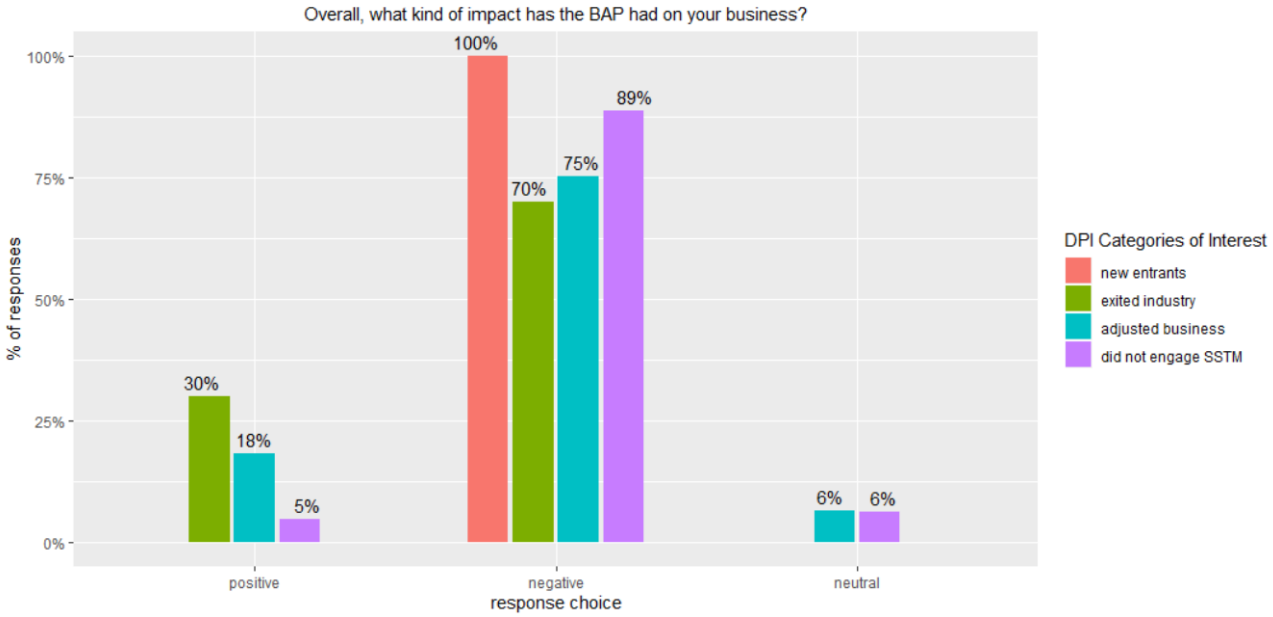
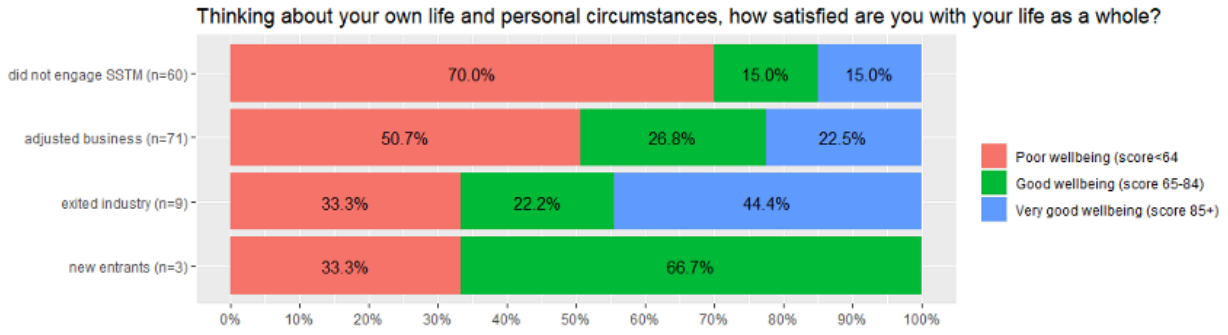


Figure 16. Survey Q14 BAP impact of business by 4 groups of interest

Those who have exited commercial fisheries had the highest level of reported wellbeing as measured by the Global Life Satisfaction score, and those who did not engage with the SSTM had the lowest (Figure 17).



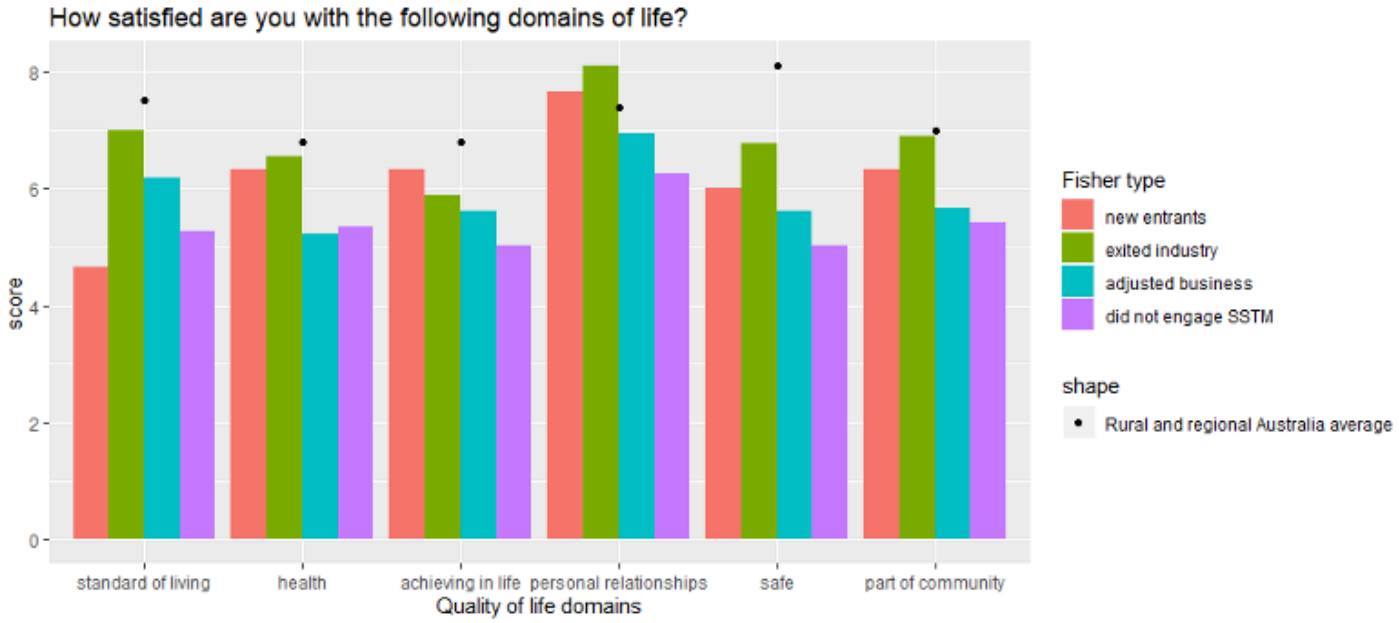
Global Life Satisfaction (GLS) score by industry status groups

Rural Avg. (2015)	Survey Avg. (2019)	Did not engage SSTM	Adjusted Business	Exited Industry	New Entrant
7.1	5.6	5.2	5.8	7.4	5.7

Figure 17. Wellbeing among 4 groups of interest (Global Life Satisfaction scores)

People who have left the Industry had higher wellbeing scores as measured by the Personal Wellbeing Index (PWI) across the six PWI questions, while two groups of fishers had consistently

lower than average scores across the six PWI questions: 1) new entrants; and 2) those who did not engage in the SSTM.



	standard of living	health	achieving in life	personal relationships	safe	part of community
Rural Average (2015)	7.5	6.8	6.8	7.4	8.1	7.0
Survey Average (2019)	5.8	5.3	5.3	6.7	5.4	5.6
new entrants	4.7	6.3	6.3	7.7	6.0	6.3
exited industry	7.0	6.6	5.9	8.1	6.8	6.9
adjusted business	6.2	5.2	5.6	6.9	5.6	5.7
did not engage SSTM	5.3	5.3	5.0	6.2	5.0	5.4

Figure 18. Personal Wellbeing Index scores among 4 categories of interest

The group of respondents who reported most positive impact from the BAP and highest satisfaction with life were those who since 2014 have **exited commercial fishing entirely** (see Figure 16, Figure 17; Figure 18). Thirteen of the 18 respondents who exited the Industry said they exited by selling all their shares and/or taking a fishing business buyout, 10 of these via the SSTM, and three by selling shares outside the SSTM. Seven of the respondents who have exited the Industry are currently retired, another seven are now working in a non-fishing business or job. Four were unemployed at the time of the survey (see Appendix 5).

Text comments left by respondents who have exited the Industry included:

> *I was in the game for nearly 30 years, and 20 years of that was 6 days a week up to 80 hours a week. It was starting to affect my body and health, and I have actually been able to get out with a decent enough payment. [It] has been bit of a new lease of life for me.*
>
> *Actually getting out reduced some stress. The buyout didn't really help that much, but I am glad not to have the worry of being in the Industry any more.*
>
> *I was really happy with my life and lifestyle as a fisherman. I am doing okay now, but basically got pushed out of the Industry due to a lack of information.*

The cost to regain what I had lost regarding quota allocation was too much. I lost out considerably through that. I used to catch 3.5 tonne of [species] per year, only got 700kg allocation. To buy that would have been ~$350,000... Given I didn't know the outcome of the reform and the new structures of the Industry, there were too many unknowns, and it was not an investment I could confidently make - felt like too much of a gamble. The bank wasn't keen on it either, too big a cost/risk to get back to where I was. However, they [NSW Government] did compensate me.

[The BAP] really just sped up a process that was already happening 'though. The fact that [I] would have had to buy more shares to stay [in the Industry] was a big factor here.

It wasn't viable already, and the option the BAP gave made it less viable. The amount of [species name] I could catch on the shares just wasn't worthwhile.

Adjusted their business

Text submissions from a fisher who had through the BAP sold many of his shares, retaining a business in two share class groups. He was one of the respondents who said trading enabled him to do what he wanted with his business, and that his business is now more profitable since the BAP.

I had some very good offers (~28 years of income) so it was an offer too good to refuse. Given my age it made a lot of sense. If I was younger, I would have had a completely different approach.

Other text comments by fishers who adjusted their businesses were less positive:

I was forced to buy shares otherwise I could not work.

Had to buy and sell to maintain some balance but still have not got full access to what I've been doing fulltime for 33 years.

Did not engage with the SSTM

Many respondents (64/163) did not participate in the SSTM. The most common response given for not participating in the SSTM was that they did not trust the system (31/131). The next most common reasons were that: the system was too hard to understand (28/131); they could not afford to trade in the SSTM (21/131); the system did not allow them to trade in the way they wanted/needed (20/131); and that they arranged to trade outside the SSTM instead (17/131) (Figure 19). It is worth noting that participants who did not participate in the SSTM had some of the poorest reported life satisfaction (see Figure 17).

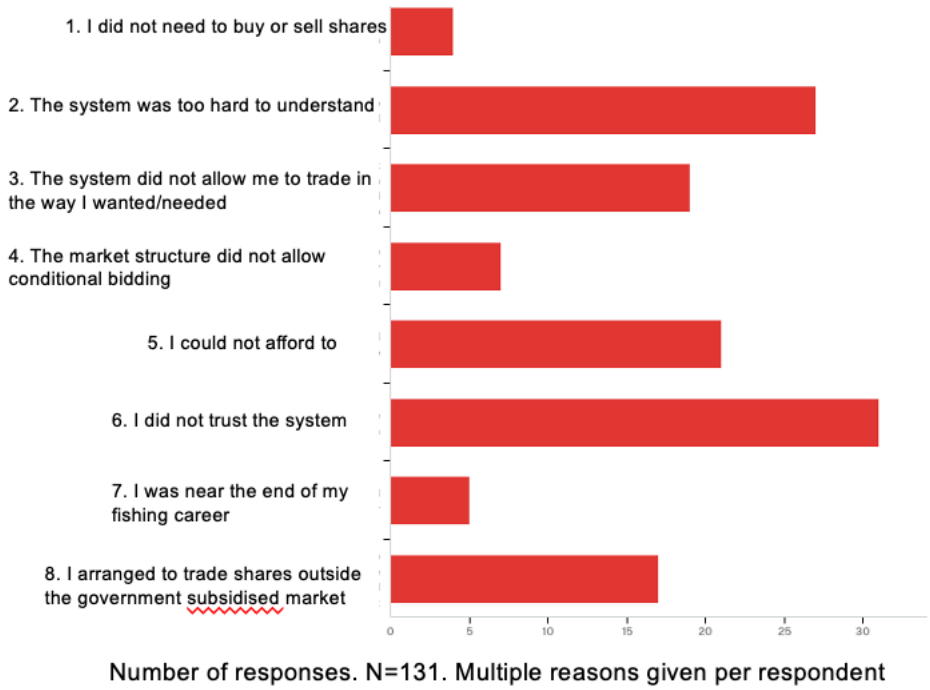


Figure 19. Survey Q20 Why not (engage in the SSTM)?

Respondents also provided text explanations about their reasons for not participating in the SSTM, many reflecting the responses about lack of trust and/or understanding of the system.

> *If I didn't arrange to buy more shares outside the share trading market I would not be fishing now as the whole system was rigged.*
>
> *I just didn't understand the system and didn't feel the system was properly explained. It just went so quick and I never got the sense of what was happening and why.*
>
> *No one had a clue because of the blind trading, and that really undermined trust from a lot of different people. [It was b]ehind closed doors.*
>
> *There was insufficient information about how the government was going to subsidize fishermen. If I had known it was going to give fishermen so many bonuses I would have joined it.*

ToR 2.2 Use the survey to understand and monitor the social and economic impact of the reforms

Most online questionnaire survey respondents reported that the BAP had a negative impact on their business. Of a list of fourteen possible positive and negative impacts of the BAP, the three most commonly selected impacts were: reduced household income; being forced to adjust their business against their will; and having to purchase more shares to continue fishing. Most survey respondents report that the contributions their Industry makes to their community is lower now than before the BAP. Most respondents report that the number of people employed in their business has not changed much as a result of the BAP. A slight majority of respondents said they now work longer hours than they did before the BAP. Of those who report longer hours, some say they are working extreme hours on the days they can fish, as a result of the BAP moving towards effort quotas that limit the number of days fishers can work in certain fisheries.

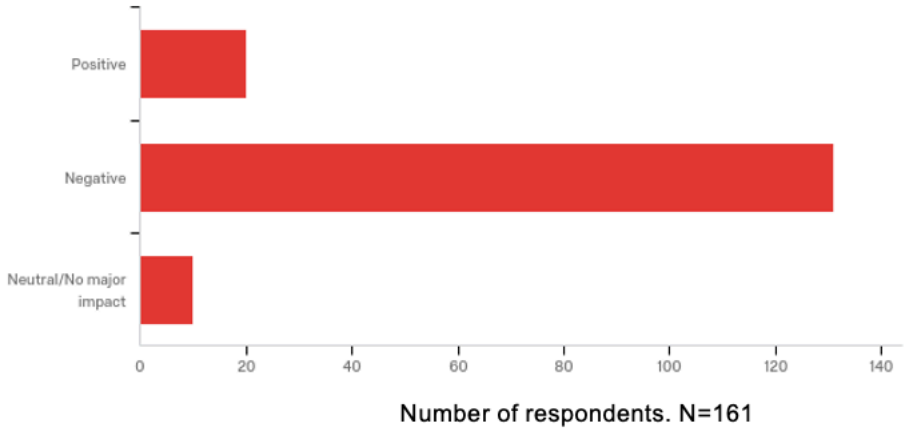


Figure 20. Survey Q14 Reported impact of BAP on business. Question: We want you to think about how the NSW Government's commercial fisheries reform in the Business Adjustment Program (BAP) affected the way you run your fishing business. Overall, what kind of impact has the BAP had on your business?

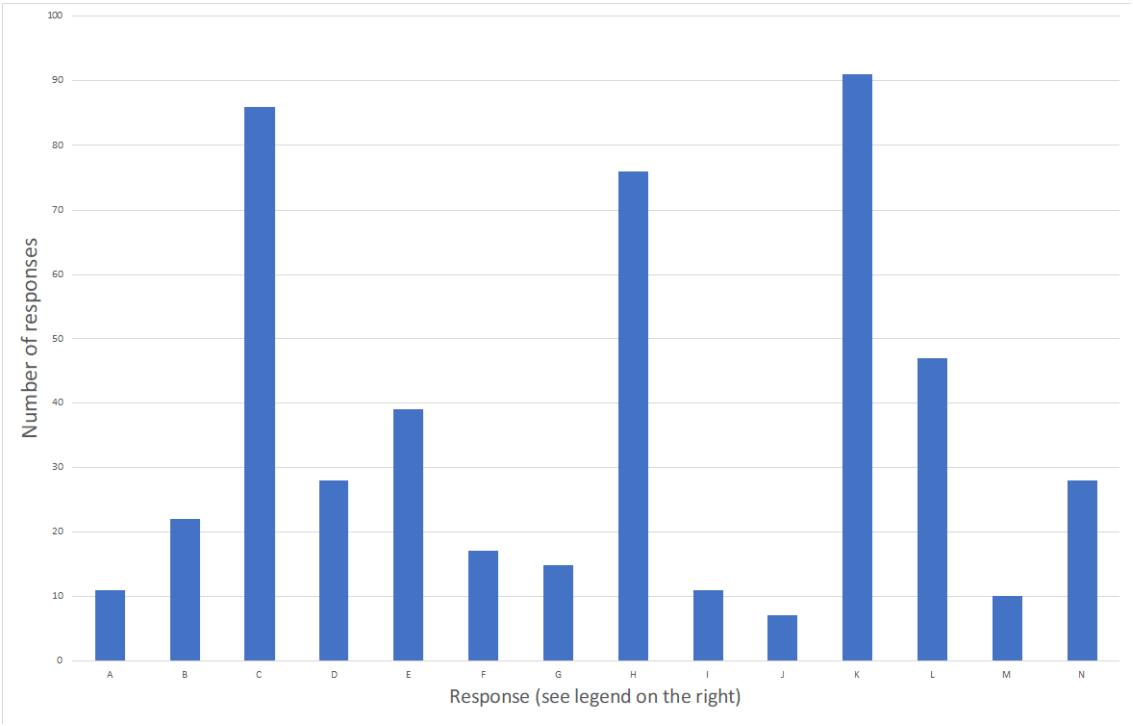


Figure 21: Survey Q15 What happened to your business as a result of the BAP? N= 488 (multiple responses invited)

Options for Q15: a. My business is more profitable, b. The value of my business has increased, c. Reduced household income, d. I was happy with the way things were and was able to continue my whole fishing business unchanged through the BAP, e. The effect of the BAP was mixed on different parts of my business. Eg, for one of my fisheries the effect was positive but for another the effect was negative, f. I'm doing other work that I find less satisfying than fishing, g. I was able to adjust my operations in the way I wanted, h. had to adjust my operations although I did not want to, i. I'm unemployed, j. I feel that my fishing rights are now more secure, k. I now have to purchase additional shares/days/quota to continue fishing, l. I'm fishing longer hours than before the reform, m. I now have greater operational flexibility, n. I drive further now because I can no longer fish close to home

The majority of survey participants (130/161) felt that the BAP has had a negative impact on their business. A minority (20/161) said the BAP had a positive effect on their business, with the remainder (10/161) saying the BAP had neutral impact (Figure 20). The most commonly reported effects from the BAP included: 1) reduced household income; 2) being forced to adjust operations against their will; and 3) having to purchase additional shares to be able to continue their business (Figure 21).

> *I make the same money, but I am working a lot harder to get that same money.*
>
> *I used to have a good business and work that I loved to do and thought I could pass on my knowledge and business to my now 18 year-old but now I own a liability that no young person would want or afford.*
>
> *My gross income has gone from 2016 to 2017 $120,000 to $27,000 . Why would you continue in this business when my accountant said I am earning less than the dole.*

Several participants in this study wrote in their text submissions that since around 2000 it has become more difficult to earn a good income in commercial fishing in NSW, citing as reasons the introduction of recreational fishing havens and marine parks as well as the BAP. For some fisheries it is a very difficult choice to leave the Industry. Low levels of schooling are common in the commercial fishing Industry (see Appendix 3 – Demographics of survey respondents), which has no educational entry requirements, so many for many fishers of working age alternative employment, especially in their current place of residence, is difficult to find.

Contributions of the NSW commercial fishing Industry to wellbeing in coastal communities

In addition to the impact of the BAP on fishing families, the BAP may potentially affect the contributions the commercial fishing Industry makes to the communities in which is it based. The questions used to ask fishers about their contributions to community wellbeing were drawn from a large contributions study on the NSW commercial fishing Industry (Voyer et al. 2016). Most respondents (77/144) said that their Industry made ‘much greater contributions’ to community wellbeing in 2014 and 14/144 said their Industry made ‘slightly greater contributions’ in 2014. Thirty respondents said the effect on community wellbeing contributions had not changed since 2014, and 20 said the Industry made ‘slightly less’ (5) or ‘much less’ contributions in 2014 (meaning they believe the Industry makes greater contributions now after the BAP has started to be implemented) (Figure 22).

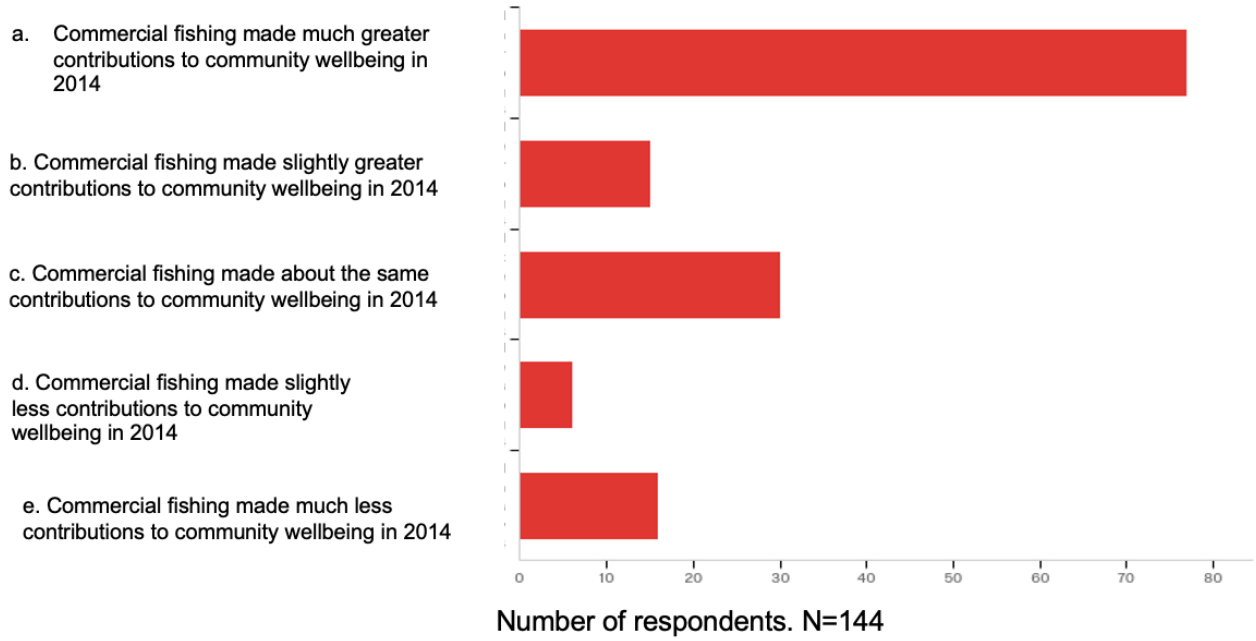


Figure 22. Survey Q39 Did the BAP affect the contributions commercial fishing makes to community wellbeing?

We also offered respondents and open-ended text box to provide examples of the links between the BAP and community wellbeing, or justify their answers. We received 36 open ended responses, with multiple response commenting on the reduction of cooperatives or increased costs of cooperatives and distribution, all which were linked to community wellbeing. Some of the statements include the following:

> *The BAP divided much of the Commercial Fishing Industry. Many have left as a result. Therefore, the contribution to community wellbeing is less.*

Several of the comments were related to the fisheries co-operatives (co-ops), which provide some employment and a sales outlet for local product, as well as donations for community events (Voyer et al. 2016). The decline in co-op business predates the BAP, but some respondents assert that the BAP has worsened conditions for co-ops.

> *Co-operatives' production has gone way down and that impacts the towns, has knock-on effects.*

> *Since the BAP the Co-op has made no community contributions. It is my Board's view that the profits belong to the fishers and if they wish to make a contribution they can. The Co-ops profit has fallen from 325K in 2015 to 95K in 2019. We have 25 fishers now compared to 38 in 2014.*

Other social impacts from the BAP: numbers employed, hours worked, workplace safety

We asked survey respondents whether the BAP has affected employment figures, and most respondents (69/97) said it has not. Two respondents said there are now more people working in their business, and 22 respondents said since the BAP there are now fewer people working in their fishing business (see Appendix 5 – Survey response details). Text responses to this question included:

> *Haven't noticed much change, seems that most people who used fishing as their main income have kept fishing.*

I would have employed another person if the share trading had gone to plan. Unfortunately, it was so confusing I missed out on the necessary shares.

We also asked whether the number of hours had changed as a result of the reform. There were mixed responses, with a slight majority of responses (39/97) saying they work longer hours after the BAP, 31/97 responses saying there is no change to their working hours, and 26/97 saying they work fewer hours now.

Although only a slight majority of respondents say they work longer hours since the BAP was introduced, the open text comments show that for fisheries where effort quota (numbers of days licensed to fish) was introduced, this seems, at least for some fishers, to have resulted in a problem of extremely long hours on the days fishing is allowed. This is potentially a health issue because sleep deprivation damages people's health, and a safety issue, with fatigue increasing the risk of accidents during fishing or on the drive home.

Because we have limited the days we can fish, we really have to make sure your 24 hours count.

Day quota has me fishing up to 24 hours in a day sometimes, as once I've logged in and used a day, I then cannot go home until I have caught enough fish/ prawns to make it worthwhile as the day quota is gone.

When endorsements are quoted on days worked, you need to get the most out of 24 hours, so you work that 24 hours, because it is not viable for your business not to. Ongoing fatigue = dangerous workplace.

ToR 2.3 Use the survey for ongoing social and economic monitoring that the NSW Government can use to inform decision making

The online questionnaire survey conducted within this project is one part of a useful framework for ongoing social and economic monitoring of NSW commercial fisheries to inform Government decision making, but the online questionnaire alone is not enough. The online survey is appropriate for canvassing perceptions and values, and for gathering data on subjective issues such as life satisfaction and wellbeing. Online surveys, however, are not useful tools for collecting objective economic data. The rest of this section specifies briefly discusses which parts of the survey and economic analysis on available data presented in this report could be useful for ongoing monitoring, and also outlines a framework for developing other elements needed for a robust monitoring system.

There are several elements of the online survey that could be useful for ongoing monitoring. The Global Life Satisfaction question, and the questions for the Personal Wellbeing Index are validated tools and will give results that can be readily compared with the Australian Rural Wellbeing Survey, which uses the same tools. The questions on business satisfaction and the contributions of commercial fishing to community wellbeing are short and could provide useful insight into trends if repeated periodically. It is less clear that the set of questions reflecting on impacts from the BAP, and interactions with the SSTM will be useful in future iterations of the survey. Q31 on gross revenue proved not to be a useful question so should not be used again.

There are few parts of the economic analysis in this report using available data that would be useful for ongoing monitoring. Most of what has been done in this report is either BAP-specific and will

be less pertinent moving forward, or should be replaced with a more robust economic monitoring framework, outlined below. The Gini analysis could be useful for ongoing monitoring, as an indicator about Industry consolidation, in conjunction with qualitative data to ascertain the reasons for and consequences of any consolidation that may occur. The breakdown of gross value of production divided by numbers of fishing businesses reporting fishing activity could be useful as an interim indicator until data on share value and/or profitability are available (see below)

New elements needed for robust ongoing social and economic monitoring

In order to design a best practice quantitative social and economic monitoring system the NSW Government should convene one or more workshops to propose context-specific objectives, indicators and data for social and economic monitoring for NSW commercial fisheries. Indicators should be designed to illuminate whether the objectives are being met. The data used in analysis should be appropriate for those indicators. The following institutions and people could be invited to such workshops: 1) CSIRO fisheries social scientists and economists; 2) ABARES social scientists and economists who work on economic data collection for Commonwealth fisheries; 3) economists from EconSearch BDO in South Australia who have been monitoring the economic performance of South Australian fisheries for the Government since the late 1990s; 4) fisheries managers from jurisdictions where economic and/or social monitoring is conducted (eg, South Australia, Commonwealth, Queensland); 5) university researchers with expertise in social and/or economic monitoring of commercial fisheries or agriculture; 6) commercial fishing Industry representatives from NSW and other jurisdictions where economic data has been collected for some time.

In addition to designing content for the monitoring, care will need to be taken in designing the process for economic data collection. The NSW commercial fishing Industry has historically been reluctant to divulge financial information (Voyer et al. 2016). Rancorous relations and low levels of trust make it likely that many fishers would strongly resist providing financial information to Government. Arguably, however, better policy will result from better understanding of the economics of the Industry, so it is in the best interests of Industry to facilitate economic data collection and analysis. The workshop process proposed above could also be used to brainstorm ways economic data could be collected such that Industry would have faith that their individual confidentiality and business interests would be protected. For example, in South Australia, the fisheries management agency does not collect or hold Industry financial data, an independent private economics company EconSearch BDO holds the identifiable data. The South Australian Government receives reports in which the data is aggregated and individual businesses are not identifiable. For Commonwealth fisheries also the fisheries management agency does not collect or hold identifiable financial data – data is collected and analysed by another agency ABARES.

We suggest a review of the monitoring framework, including objectives, indicators, methods and data and a detailed round of data collection should be conducted every five to ten years. In the intervening years, or every two years, a light updating of data could occur. For example, economic data could be indexed, and a small set of qualitative interviews could be conducted with key informants by phone or teleconference.

A final point about new elements for a monitoring framework is that stakeholders beyond commercial fishers should also be surveyed. The current study was limited to commercial fishers. Community representatives in fishing towns, such as Chambers of Commerce, stakeholders in supply chains, such as fisheries cooperatives, the coastal tourism Industry and food service sectors should also be surveyed. Perspectives of Aboriginal businesses, communities and expert individuals should also be canvassed.

Qualitative social and economic data collection
Social and economic monitoring should be mixed methods. In addition to semiquantitative questionnaire and quantitative economics methods, ongoing monitoring should include a qualitative interview and/or focus group discussion element. Individual and group interviews enable the researchers and respondents to explore complex interrelated issues to inform the design of quantitative data collection and analysis. Qualitative methods are also useful for ground truthing and triangulation with results from semiquantitative questionnaire and quantitative economic methods (Barclay et al. 2017). The questions to ask in qualitative data collection should be developed in alignment with the monitoring objectives and indicators set in the expert and stakeholder workshop process.

Quantitative social and economic data collection
Below is a list of data that could be potentially useful for monitoring commercial fisheries in NSW. The exact data to be included should be worked out as part of the workshop process to design a monitoring framework, including objectives that are agreed on with stakeholders, indicators that will reveal whether those objectives are being met, and data that is appropriate for those indicators (as suggested above).

Quantitative data on Industry economic performance
Share quota values. DPI currently collects information about share transfers, but not comprehensive information about the value of transfers. The value of quota is directly related to economic performance, in that a fishery with poor performance will have low quota values, whereas fishers will pay more for quota in fisheries that are performing well.

Profitability. In theory, with ITQs the economic performance of the Industry can be evaluated from share values, and it is no longer necessary to look at profitability across fisheries. In practice, sometimes share values will not give a clear enough picture for the evaluation. For example, if shares are not often transferred there will not be enough information. Another consideration for NSW is that the BAP was a recent event and it may be some time before share transfer values settle to an accurate reflection of Industry economic performance. Unfortunately the Industry disruption from COVID-19 in 2020 will delay any emerging evidence. Evaluating profitability across fisheries could use the 2012-13 data in the Voyer et al. (2016) study as a baseline and continue from there. Profitability is understood through data on income relative to costs. Proxies can be used to gain a picture of income and costs instead of detailed financial data from individual businesses. Costs vary greatly according to fishing practices. For example, fuel is a key cost for trawl fisheries, but less important for estuarine net and trap fisheries. It is important to understand the nuances of different business models to grasp crew economics. In the NSW case payments for nominated fishers is an important consideration. The amounts paid to an Abalone diver can be a specific amount per kilo to and provides information on contracted catching costs, which when related to revenues per kilo can indicate profit per kilo.

Quantitative data on employment
To understand how the commercial fishing Industry is benefiting the community of NSW as per the objects of the Act, it is important to know more about employment in the Industry. Australian Bureau of Statistics data is a starting point, but it may need supplementation to provide a clear picture. Employment monitoring should include gender disaggregated numbers of crew, informal family employment, administrative and other support staff, and processing staff. Remuneration data captured for monitoring profitability would also be useful here. In addition to fishers self reporting on health in the online survey, it would be useful to include objective statistics, along the lines recommended in recent reports on health and workplace safety in the commercial fishing Industry (King et al. 2019; Brooks et al. 2019).

Quantitative data on seafood prices and supply

Commercial fishing is only one part of seafood value chains. To properly understand the economic performance of fishing it is important to understand the whole value chains. It is also important to understand the relative situations of locally produced seafood vis a vis imports in domestic markets, and exports of locally harvested seafood. Reliable seafood prices data can assist with understanding fisher incomes (for profitability, above). Prices data can come from fishers, markets, both, and other stakeholder groups (processors, retailers, food service).

Recommendations

1. Establish a social and economic monitoring framework for NSW commercial fisheries as a matter of high priority and urgency

Responsibility: NSW DPI and the NSW commercial fishing Industry

The importance of ongoing social and economic monitoring is one of the key lessons arising from this evaluation of the social and economic impacts of the BAP. This project has initiated a partial baseline for continuing monitoring of NSW commercial fisheries. Understanding social and economic aspects of an Industry is necessary for best practice fisheries management. When time series data is available, next time a policy change is proposed for NSW fisheries it will be much easier to do a social and economic impact assessment and a cost benefit analysis before making the change, and it will be much easier to track impacts after the change. Ongoing reporting on the social and economic aspects of NSW commercial fisheries also has the potential to improve engagement between DPI and the Industry because it will provide evidence about the scale and extent of issues raised by stakeholders. Better social and economic data is also crucially important for the development of Harvest Strategies in fisheries management, such as developing Maximum Economic Yield (MEY) reference points for harvest control rules.

The first step in creating a monitoring framework is to establish appropriate social and economic objectives for the management of NSW commercial fisheries, via a participatory process with commercial fisheries stakeholders and experts who have relevant applied experience and/or research knowledge (see section ToR 2.2 for suggestions about relevant experience and knowledge). These objectives should be SMART (Specific, Measurable, Achievable, Realistic, and Timely). Flowing on from the objectives, suitable social and economic indicators will need to be developed that will reveal whether or not those objectives are being achieved. Flowing on from the indicators, a suite of existing and new data will need to be collated for analysis that are appropriate to the indicators (see section ToR 2.2 for suggestions about potentially appropriate data).

The monitoring framework should be periodically reviewed. A comprehensive process of data collection and analysis should be completed periodically – possibly every 5-10 years. In intervening annual or biannual periods a light process could be conducted, for example, indexation of prices and costs, and a small set of qualitative key informant interviews or focus groups. The monitoring framework might consist of the following elements:

1. Parts of the semiquantitative online questionnaire survey developed in this project, especially on fisher wellbeing, fishing Industry contributions to community wellbeing, and values and perceptions about the fishing Industry and fisheries management.

2. More qualitative (eg, interview and focus group) data to explore complex interrelations between social and economic factors in commercial fisheries.

3. More quantitative objective data on the economic performance of commercial fishing – particularly the recording of share values, and business income relative to costs. Quantitative data on aspects such as employment numbers, health and safety in the commercial fishing Industry, and markets, prices and supply would also be potentially useful for monitoring social and economic aspects of commercial fisheries in NSW.

2. Investigate further whether the levels of commercial debt incurred as a result of the BAP are damaging Industry viability, and if so, consider interventions to alleviate that debt

Responsibility: NSW DPI and the NSW commercial fishing Industry

There is no high quality, objective, time series data about the value of share trades, profitability, debt and equity in the NSW commercial fishing Industry. The available data, however, indicates that the level of debt taken on by the NSW commercial fishing Industry to buy shares in response to the BAP (ToR 1.2.1) in fisheries that had existing low levels of profitability (Voyer et al. 2016) has likely reduced business viability. This may be offset by unquantified viability improvements from instituting ITQs and ITEs, but the available evidence does not indicate overall viability improvements at this stage. Having regard to the objects of the Act, the debt incurred in response to the BAP appears to be a problem not only for the object to promote a viable Industry, but also for the object to generate social and economic benefits for the wider community of NSW (see discussion ToR 1.5). The period of data collection for this report predates the COVID-19 crisis, but conversations with Industry people and media coverage indicate that the NSW commercial fishing Industry, as with fishing Industries around Australia and internationally, has suffered huge disruption from measures to prevent the spread of COVID-19. If the NSW Government could reduce the amount of commercial debt taken on by Industry to pay for shares under the BAP, there should be better outcomes for Industry viability and community benefits. For example, the loans under the RAA could be expanded so that fishing businesses can replace commercial loans with lower interest loans.

3. Consider instituting protections from changes to resource access in commercial fisheries management

Responsibility: NSW DPI and the Minister responsible for the Act

Two decades of changes in access to fisheries resources through the establishment of recreational fishing havens and sanctuary zones in marine parks, and then requiring fishers to pay for their existing fisheries access via the BAP have undermined security in access to the resource by NSW commercial fishers, and eroded Industry trust in Government. In the current NSW legislative management plan framework the Minister can readily change fisheries access impacting the rights security of Industry (see section on ToR 1.1 for discussion on this point). In other Australian jurisdictions, such as South Australia, there are examples of procedures required for changes to fisheries management plans that give greater security of access to Industry. Concrete moves to reduce sovereign risk in the NSW commercial fishing Industry could mend bridges and improve trust between Industry and Government over fishing rights into the future.

4. Investigate more effective ways of doing consultation and policy development

Responsibility: NSW DPI, the NSW commercial fishing Industry and Aboriginal communities

A thorough evaluation of governance, consultation and communication between Government and Industry was beyond the scope of this project, but such an evaluation would be very useful for understanding how to improve relations between Industry and Government, to enable Industry to move forward after the BAP.

Considerable effort was put into Industry consultation for the BAP, but it did not achieve the desired outcome of ‘bringing Industry along’ with the policy change. Improving stakeholder engagement is not an easy ‘fix’. Many marine resource governance agencies around Australia are grappling with this problem. Rather than viewing this as a relatively ‘surface’ communication problem, it is necessary to consider deep-seated and structural change to relations between government and Industry. Rethinking current co-management to empower greater stakeholder involvement may be a fruitful direction.

One part of such an evaluation could be to further investigate the perceptions of differential treatment of Aboriginal fishers compared to non-Aboriginal fishers reported in the survey. A reconciliation and engagement strategy with awareness training for non-Aboriginal fishers may be the most appropriate way to address the situation, since it is part of a serious structural issue relating to Aboriginal rights to Sea Country that is yet to be thoroughly addressed in NSW.

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Appendix 1 – Project Terms of Reference

Commercial Fisheries Business Adjustment Program: Terms of Reference - Economic analysis & social and economic monitoring

Purpose

The NSW Government has made a commitment to review the socio-economic impacts of the NSW Commercial Fisheries Business Adjustment Program (BAP).

This project will assess economic and socio-economic impacts through:

- Economic analysis of effects of the BAP via existing DPIE data;
- Developing a survey of the commercial fishing Industry to evaluate the social and economic impacts of the BAP, and to establish baseline data for ongoing monitoring and evaluation.

The review will provide independent advice to the NSW Government on whether the Commercial Fishing Reforms of the NSW Government have been effective in;

- ensuring the long-term viability of the NSW commercial fishing Industry;
- improving the strength and value of shareholders' access rights; and
- providing shareholders with improved opportunities and flexibility to tailor their access.

Economic analysis

The aim of the economic analysis is to survey available data, from the period 2009/10 onwards, to assess the impacts of the BAP on the security, viability and value of the commercial fishing Industry.

The tasks include but are not limited to:

- Reviewing reported commercial fisheries catch and effort data;
- Reviewing all available relevant economic, financial, investment and pricing information;
- Considering potential trends under a 'without intervention' scenario;
- In light of the above, assess the impact of the new commercial fisheries management framework implemented as part of the BAP, on the security, viability and value of the commercial fishing Industry, having regard to the objects of the Fisheries Management Act 1994; and
- Report on the effectiveness of existing governance and consultation processes in facilitating consultation and communication between Government and Industry

Social and economic monitoring

The aim is to refine and conduct a commercial fisheries stakeholder survey suitable for monitoring social and economic impact on an ongoing basis.

The aim of social and economic monitoring is to survey commercial fishers, who through the time period affected by the BAP:

- have entered (became commercial fishing business (FB) owners)
- have exited (no longer own a fishing business or shares)
- have adjusted (purchased or sold shares to tailor their businesses), or
- did not engage

The focus of the survey will be on collecting information that the NSW Government can:

- use to better understand and monitor the social and economic impact of the reforms
- usefully respond to, and/or
- use to inform decision making.

Survey design and analysis will consider any factors unrelated to the BAP that may have had a social or economic impact on the commercial fishing Industry or individual fishers.

The focus of this survey is commercial fishers. Aboriginal fishers will not be surveyed separately, but respondents will have the opportunity to identify as Aboriginal and/or Torres Strait Islander (ATSI), which will enable distinction of results (and allow for follow up if results indicate this to be necessary).

The final report will be delivered to the NSW Government by the end of the year.

DOC19/29507

Accessed 12 Jun 2020 from:

https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0008/1157867/Terms-of-reference-Economic-analysis-and-social-and-economic-monitoring.pdf

Appendix 2 – Ethics and confidentiality

The project makes use of two sources of primary data: 1) an independent survey the UTS research team conducted, open to all commercial fishers in NSW; and 2) data from DPI, on catches, gross value of production, and the ownership and trading of fisheries shares.

This study was managed and conducted within the Institute for Sustainable Futures at the University of Technology Sydney. Studies undertaken by the Institute for Sustainable Futures have been approved in principle by the University of Technology Sydney, Human Research Ethics Committee. The project underwent ethics review and was approved under the Institute for Sustainable Futures' program approval. The survey design, implementation, and analysis followed the process approved in the ethics application.

DPI has data on fisheries share ownership and on share trading, which helps understand what has happened with the BAP. This is important to see how the shape of the Industry and constituent fisheries have changed over the years since the BAP was implemented. We requested this data in August, but because of the confidential nature of the business information DPI were required to clarify the legal implications, have confidentiality agreements signed, and de-identify the data. We received an initial batch of data to look at on 10th October. After seeing what was in there we had further questions and requests and received the final dataset on 15th November. We then started analysing the data and writing it up. Further to feedback received in April 2020 and subsequent meetings with DPI, we received further data to finalise the report. The quantitative data sourced from DPI was discussed and shared in accordance with the Digital Data License agreement signed 6 September 2019.

It was also important to have Industry feedback on the draft report before finalising it. Based on experience with other projects, feedback on drafts from stakeholders who know the subject matter 'inside-out', is useful for validating data and analysis. Due to the contentious nature of the content, however, it was important to make sure the draft remained confidential until the report was finalised, and also that no particular industry players were seen as having more of a chance to influence the report over other industry players. For this reason, we requested that the NSW Ministerial Fisheries Advisory Council give feedback on the report before it was finalized.

Appendix 3 – Demographics of survey respondents

The demographic details and business profiles of the sample of NSW who participated in the survey for this project are similar to the demographic details and types of fishing in the overall NSW commercial fishing Industry. This is visible in the comparisons between participants in our survey and NSW DPI data on licenced fishing businesses (see Table 13, Table 14 and Table 15).

Table 13. Demographic details of survey participants compared to whole Industry

	Survey for this project %	DPI database of licensed fishing businesses %
Male	95	96
Female	5	4
Identify as Aboriginal or Torres Strait Islander	15	NA
Answered 'yes' to: Is English your main speaking language?	99	NA
Age		
Over 60	32	38
50-59	22	30
40-49	30	18
30-39	14	11
Under 30	2	3
Year started working in the NSW commercial fishing Industry		
Before 1970	7	NA
1970-79	20	17
1980-89	22	23
1990-99	24	16
2000-10	13	18
2010 and after	14	26
Level of schooling		
Left before year 10	27	NA
Left after year 10	32	NA
Left after year 12	18	NA
Completed tertiary education (TAFE or university)	23	NA

Notes: DPI license database details do not include all of the demographic data we collected in the survey. 'NA' indicates this data was 'not available' in the DPI database. The DPI database included 608 individuals, 86 partnerships and 98 companies. The percentages for these demographics were worked out on the basis of the 608 individuals. The DPI years for starting to work in the commercial fishing Industry are the year they first registered, and includes the full 792 businesses, not just the individuals. This information was only collected from 1977. So, some of the people who registered for a commercial fishing license in 1977 may have been fishing from before 1970. The DPI information is only from registered nominated fishers and business owners, they do not collect data from crew because crew are not required to register with DPI. Less than 10 survey respondents were crew, so this is not likely to significantly affect our comparisons.

Table 14. Regions fished survey participants compared to whole Industry

	Survey for this project 2019 %	DPI database of licensed fishing businesses 2019
Region 1 (Tweed Heads, Byron Bay, Ballina)*	11.80%	10
Region 2 (Yamba)	16.85%	12
Region 3 (Coffs Harbour, South West Rocks)	16.85%	15
Region 4 (Tuncurry, Forster, Newcastle)	32.02%	31
Region 5 (Sydney)	8.43%	10
Region 6 (Nowra, Ulladulla)	6.74%	9
Region 7 (Batemans Bay, Narooma, Eden)	7.30%	13

* Participants could select multiple regions as appropriate

Source: project survey and NSW DPI license database. The DPI figures for this are based on the residential address given for the license. This will vary in some cases from where the fishers operate, but gives some comparability to see whether certain regions of the coast were over or underrepresented in the survey sample.

Table 15. Fishing share classes survey participants compared to whole Industry

	Share classes fished	Survey participants 2019 %	DPI database of licensed fishing businesses 2019 %
1.	EG Meshing – all regions	14.55	12
2.	EG Prawning – all regions	9.33	8
3.	EG Mud crab trapping – all regions	7.65	4
4.	OTL Line fishing western zone	7.65	8
5.	EG Trapping – all regions	6.90	4
6.	EG Handline	5.78	10
7.	EG Category one hauling – all regions	4.85	4
8.	OTL Demersal Fish trap	4.85	6
9.	OH Hauling net (general purpose) – all regions	6.16	6
1.	EG Category two hauling – all regions	3.36	3
2.	EG Eel Trapping – all regions	3.36	4
3.	OT Inshore prawn	2.99	4
1.	OH Garfish net (hauling) – all regions	2.99	1
4.	EG Hand gathering – all regions	2.99	3
5.	OT Offshore prawn	2.80	4
6.	OTL Line fishing eastern zone	2.24	3
7.	Lobster	2.05	4
8.	EPT Clarence River	2.05	2
9.	OH General ocean hauling – all regions	1.31	3
10.	EPT Hawkesbury River	0.93	1
11.	OTL Spanner crab northern & southern zone	1.49	1
1.	OTL School and gummy shark	0.75	0.5
2.	OT Deepwater prawn	0.56	1
3.	OH Purse seine	0.56	0.6
4.	OH Pilchard, anchovy and bait net (hauling) all regions	1.12	0.7
1.	OT Fish Northern zone	0.37	1
2.	Abalone	0.19	2
3.	EPT Hunter river	0.19	0.6
4.	Southern Trawl	0.00	0
5.	Sea Urchin and Turban Shell (SUTS)	0.00	0
6.	Inland	0.00	0

Note: Survey participants could select multiple share classes as appropriate.

The people who participated in the survey were mainly fishing business owners who also fish (see Table 16). There were only a few investors who own fishing businesses but do not fish themselves. Likewise, a few crew members and nominated fishers who do not own fishing businesses participated. Some of the people who participated are new entrants to commercial fishing in NSW and some have exited the Industry.

Table 16. Involvement in commercial fishing 2014, 2019

Questions	2014	2019
I own a commercial fishing business and fish some or all of the shares associated with that business. If I do not fish all of the shares associated with my business I may lease them to a nominated fisher.	141	142
I am the nominated/authorised fishers on a business/shares I don't own.	11	7
I own a commercial fishing business but I do not have a licence or endorsement to fish.	1	3
I work as fishing crew.	6	2
I am not involved in 2019 as I exited the Industry in the last 5 years.	-	17
I was not involved in 2014 as I am new to the Industry.	12	-
Total responses to this question	171	171

We also asked respondents to estimate how much of their income from the financial year 2017-2018 came from commercial fishing in NSW state fisheries. More than 100 of the 159 survey responses to the question on income report that more than 90 per cent of their income comes from state fisheries. This makes intuitive sense, in that people whose main income comes from state fisheries would be motivated to 'have a say' about the reform of state fisheries through the survey.

Appendix 4 – Survey script

Below is the text of the survey used in 2019 for this report. There are two points to note for future iterations of the survey.

1. We tried in the survey to collect data about profitability, business size, share value and business value, and have concluded it cannot be effectively done with this type of survey. See the Recommendations section for our suggestions on how this important economic data could be collected.
2. This version of the survey omitted a question for new entrants about why they entered the Industry. This is probably useful information to collect in future.

Start of Survey:

NSW commercial fisheries Business Adjustment Program (BAP) and ongoing social and economic monitoring

This study is a fully independent evaluation of the BAP, and will provide DPIE with a guide for conducting ongoing monitoring of social and economic aspects of fisheries into the future. By clicking 'I Agree' Below I consent to participating in the research project being conducted by the Institute for Sustainable Futures (ISF) of the University of Technology Sydney (UTS) and funded by the NSW Department of Planning, Industry and the Environment (DPIE). DPIE will not have access to any data. DPIE will be given a report written by the UTS team about the survey data, using it to evaluate the BAP recommend to DPIE how to continue to monitor social and economic aspects of fisheries into the future. We will recommend a summary of independent results is made public. If there are important aspects of your story that have been missed please feel free to email us on kate.barclay@uts.edu.au or federico.davila@uts.edu.au and we will include any extra statements you wish to provide to the research team. I am aware that I can contact Professor Kate Barclay if I have any concerns about the research. She can be reached on Kate.Barclay@uts.edu.au. I also understand that I am free to withdraw my participation from this research project at any time I wish without giving a reason. I understand that the research data gathered from this project will be published in a form that will not identify me in any way.
Research ethics
Studies undertaken by the Institute for Sustainable Futures have been approved in principle by the University of Technology Sydney, Human Research Ethics Committee. If you have any complaints or reservations about any aspect of your participation in this research you may contact the Research Ethics officer on: Research.Ethics@uts.edu.au. **Do you agree to the items above and want to provide an anonymous open ended comment? You can do this multiple times if you think of new comments.**

I agree. (1)
I do NOT agree. (2)

Skip To: End of Survey If NSW commercial fisheries Business Adjustment Program (BAP) and ongoing social and economic moni... = I do NOT agree.
End of Block: Landing

Start of Block: Block 9
Q69 Please write your anonymous comment below:
_____

Skip To: End of Survey If Condition: Please write your anonymous... Is Displayed. Skip To: End of Survey.
End of Block: Block 9
Start of Block: Demographics

D1 Q1. What is your gender?
Male (1)
Female (2)

D2 Q2. What is your age?

	10	20	30	40	50	60	70	80	90	100
1 ()										

D3 Q3. Are you an Aboriginal or Torres Strait Islander?
Yes (1)

No (2)

D4 Q4. Is English your main speaking language?
Yes (1)
No (2)

D5 Q5. What is the highest level of education you have completed?
left school before year 10 (1)
left school after year 10 (2)
left school after year 12 (3)
completed tertiary education (TAFE or university) (4)

D6 Q6. What year did you start working in the commercial fishing Industry in NSW?

	1950	1960	1970	1980	1990	2000	2010	2020
1 ()								

D7 Q7. What is your **current** involvement in commercial fishing in NSW?
I own a commercial fishing business and fish some or all of the shares associated with that business. If I do not fish all of the shares associated with my business I may lease them to a nominated fisher. (1)
I am the nominated/authorised fisher on a business/shares I don't own. (2)
I own a commercial fishing business but I do not have a license or endorsement to fish. (3)
Crew (4)
None, I exited the Industry in the last 5 years (5)

D8 Q8. What was your involvement in commercial fishing in NSW in **2014**?
I own a commercial fishing business and fish some or all of the shares associated with that business. If I do not fish all of the shares associated with my business I may lease them to a nominated fisher. (1)
I am the nominated/authorised fisher on a business/shares I don't own. (2)
I own a commercial fishing business but I do not have a license or endorsement to fish. (3)
Crew (4)
None, I am new to the Industry (5)

D9 Q9. What percentage of your income for financial year 2017-18 came from commercial fishing in NSW state fisheries?

	0	10	20	30	40	50	60	70	80	90	100
1 ()											

D10a Q10. In which regions are you fishing in **2019**? Select all that apply.
Region 1 (Tweed Heads, Byron Bay, Ballina) (1)
Region 2 (Yamba) (13)
Region 3 (Coffs Harbour, South West Rocks) (14)
Region 4 (Tuncurry, Forster, Newcastle) (15)
Region 5 (Sydney) (16)
Region 6 (Nowra, Ulladulla) (17)
Region 7 (Batemans Bay, Narooma, Eden) (18)

D10b Q11. In which regions were you fishing in **2014**? Select all that apply.
Region 1 (Tweed Heads, Byron Bay, Ballina) (1)
Region 2 (Yamba) (13)
Region 3 (Coffs Harbour, South West Rocks) (14)
Region 4 (Tuncurry, Forster, Newcastle) (15)
Region 5 (Sydney) (16)
Region 6 (Nowra, Ulladulla) (17)
Region 7 (Batemans Bay, Narooma, Eden) (18)

Note:
The fishery share classes are complex and the following questions did not work as well as they could to identify what fisheries were relevant to respondents. In the next iteration of the survey this should be clarified.

D11 Q12. What share classes did you fish in **2019**? Select all that apply.

Lobster (1)
Abalone (2)
Meshing – all regions (25)
Category one hauling – all regions (26)
Category two hauling – all regions (27)
Mud crab trapping – all regions (28)
Trapping - all regions (29)
Eel Trapping - all regions (30)
Prawning - regions except 5 (31)
Prawning - region 5 (32)
Hand gathering - regions except 5 (33)
Hand gathering - region 5 (34)
Handline (35)
Clarence River (37)
Hunter river (38)
Hawkesbury River (39)
Line fishing western zone (41)
Line fishing eastern zone (42)
Demersal fish trap (43)
School and gummy shark (44)
Spanner crab northern zone (45)
Spanner crab southern zone (46)
Inshore prawn (47)
Offshore prawn (48)
Deepwater prawn (49)
Fish northern zone (50)
Hauling net (general purpose) – region 1 (51)
Hauling net (general purpose) – regions 2, 4 and 6 (52)
Hauling net (general purpose) – region 3 (53)
Hauling net (general purpose) – region 5 (54)
Hauling net (general purpose) – region 7 (55)
General ocean hauling – all regions (56)
Purse seine (57)
Pilchard, anchovy and bait net (hauling) – regions 1, 3, 5 and 7 (58)
Pilchard, anchovy and bait net (hauling) – region 2 (59)
Pilchard, anchovy and bait net (hauling) – regions 4 and 6 (60)
Garfish net (hauling) – region 1 (61)
Garfish net (hauling) – regions 2, 3, 4, 5, 6 and 7 (62)

D12 Q13. What share classes did you fish in **2014**? Select all that apply.
Lobster (1)
Abalone (2)
Meshing – all regions (25)
Category one hauling – all regions (26)
Category two hauling – all regions (27)
Mud crab trapping – all regions (28)
Trapping - all regions (29)
Eel Trapping - all regions (30)
Prawning - regions except 5 (31)
Prawning - region 5 (32)
Hand gathering - regions except 5 (33)
Hand gathering - region 5 (34)
Handline (35)
Clarence River (37)
Hunter river (38)
Hawkesbury River (39)
Line fishing western zone (41)
Line fishing eastern zone (42)
Demersal fish trap (43)
School and gummy shark (44)
Spanner crab northern zone (45)
Spanner crab southern zone (46)
Inshore prawn (47)

Offshore prawn (48)
Deepwater prawn (49)
Fish northern zone (50)
Hauling net (general purpose) – region 1 (51)
Hauling net (general purpose) – regions 2, 4 and 6 (52)
Hauling net (general purpose) – region 3 (53)
Hauling net (general purpose) – region 5 (54)
Hauling net (general purpose) – region 7 (55)
General ocean hauling – all regions (56)
Purse seine (57)
Pilchard, anchovy and bait net (hauling) – regions 1, 3, 5 and 7 (58)
Pilchard, anchovy and bait net (hauling) – region 2 (59)
Pilchard, anchovy and bait net (hauling) – regions 4 and 6 (60)
Garfish net (hauling) – region 1 (61)
Garfish net (hauling) – regions 2, 3, 4, 5, 6 and 7 (62)

End of Block: Demographics
Start of Block: BAP Q14-Q16

BAP_1 Q14. We want you to think about how the NSW Government's commercial fisheries reform in the Business Adjustment Program (BAP) affected the way you run your fishing business. Overall, what kind of impact has the BAP had on your business?
Positive (1)
Negative (2)
Neutral/No major impact (3)

BAP_2 Q15. Which of the following things have happened to your business as a result of the BAP?
a. My business is more profitable (1)
b. The value of my business has increased (4)
c. Reduced household income (5)
d. I was happy with the way things were and was able to continue my whole fishing business unchanged through the BAP. (6)
e. The effect of the BAP was mixed on different parts of my business. Eg, for one of my fisheries the effect was positive but for another the effect was negative. (18)
f. I'm doing other work that I find less satisfying than fishing (7)
g. I was able to adjust my operations in the way I wanted (8)
h. had to adjust my operations although I did not want to (19)
i. I'm unemployed (9)
j. I feel that my fishing rights are now more secure (10)
k. I now have to purchase additional shares/days/quota to continue fishing (11)
l. I'm fishing longer hours than before the reform (12)
m. I now have greater operational flexibility (13)
n. I drive further now because I can no longer fish close to home (14)

Q79 Additional comments on above (optional):
_____

Q27 Q16. How did you respond to the BAP reform?
a. I **continued** continued in the commercial fishing Industry much as before, or through adjusting my business (1)
b. I **continued** in one or more of my fisheries, but exited one or more of my fisheries (5)
c. I **entered** the Industry by buying my first commercial fishing business (if you already owned a CF business please answer [a]) (2)
d. I **left** the commercial fishing Industry by selling or surrendering my business(es) (3)

Q83 Additional comments on above (optional):
_____

Display This Question:
If Q16. How did you respond to the BAP reform? = d. I left the commercial fishing Industry by selling or surrendering my business(es)

Q84 Q16_C. How did you leave the commercial fishing Industry?
i. I sold all my shares and/or took a fishing business buyout (1)

ii. I sold my business(es) without any Government assistance (2)
iii. I sold my fishing business but continued fishing (3)

Display This Question:
If Q16_C. How did you leave the commercial fishing Industry? = i. I sold all my shares and/or took a fishing business buyout

Q85 Q16_c_i. I sold all my shares and/or took a fishing business buyout....
1. via the Subsidised Share Trading Market in mid-2017 (1)
2. before the Subsidised Share Trading Market (4)
3. after the Subsidised Share Trading Market (5)
4. outside (but at the same time as) the Subsidised Share Trading Market (6)

Display This Question:
If Q16_C. How did you leave the commercial fishing Industry? = iii. I sold my fishing business but continued fishing

Q86 Q16_c_iii. I sold my fishing business but continued fishing as (multiple choices possible):
1. Nominated fisher (1)
2. Crew (4)
3. Other fisheries related work (eg, mending nets) (5)

End of Block: BAP Q14-Q16
Start of Block: BAP Q17-Q18

Display This Question:
If Q16. How did you respond to the BAP reform? = d. I left the commercial fishing Industry by selling or surrendering my business(es)

Q87 Q17. Why did you leave the commercial fishing Industry?
1. I wanted to leave for reasons unrelated to the BAP (1)
2. I wanted to or felt I had to leave because of the BAP (4)

Display This Question:
If Q16. How did you respond to the BAP reform? = d. I left the commercial fishing Industry by selling or surrendering my business(es)

Q88 Additional comments on above (optional):
_____

Display This Question:
If Q16. How did you respond to the BAP reform? = d. I left the commercial fishing Industry by selling or surrendering my business(es)

Q89 Q18. What are you doing now after exiting the fishing Industry?
1. I'm now doing another business/job (1)
2. I'm unemployed (4)
3. I'm retired (5)

Display This Question:
If Q16. How did you respond to the BAP reform? = d. I left the commercial fishing Industry by selling or surrendering my business(es)

Q98 Additional comments on above (optional):
_____

End of Block: BAP Q17-Q18
Start of Block: Q19-Q30

Q33 Q19. Did you trade in the Subsidised Share Trading Market?
a. Yes (1)
b. No (2)

Skip To: Q40 If Q19. Did you trade in the Subsidised Share TradingMarket? = a. Yes

Q34 Q20. Why not? Please select all that apply.
1. I did not need to buy or sell shares (1)
2. The system was too hard to understand (14)
3. The system did not allow me to trade in the way I wanted/needed to (15)
4. The market structure did not allow conditional bidding (16)
5. I could not afford to (17)
6. I did not trust the system (18)
7. I was near the end of my fishing career (19)
8. I arranged to trade shares outside the government subsidised market (20)

Q90 Additional comments for above (optional):
_____

Q36 Q21. What have the consequences been of **not** participating in the Subsidised Share Trading Market (multiple choices allowed)?
1. No significant consequences - I continued fishing (1)
2. No significant consequences - I reduced or stopped fishing as already planned (4)
3. I was forced to reduce or stop fishing (5)
4. I paid more for shares than I would have (6)

Q91 Additional comments for above (optional):
_____

Q39 Q22. Did you trade shares outside the Subsidised Share Trading Market?
Yes (1)
No (2)

Skip To: End of Block If Q22. Did you trade shares outside the Subsidised Share Trading Market? = No

Display This Question:
If Q16. How did you respond to the BAP reform? = a. I continued continued in the commercial fishing Industry much as before, or through adjusting my business
Or Q16. How did you respond to the BAP reform? = c. I entered the Industry by buying my first commercial fishing business (if you already owned a CF business please answer [a])
Or Q16. How did you respond to the BAP reform? = b. I continued in one or more of my fisheries, but exited one or more of my fisheries

Q40 Q23. Why did you trade shares? Select all that apply.
1. I believed the value of the shares will go up (1)
2. I believed the value of the shares will go down (4)
3. I used share trading as a chance to **increase** my fishing business (5)
4. I used share trading as a chance to **decrease** my fishing business (6)
5. I had to sell shares in one fishery to maintain the necessary number of shares in another (7)
6. I needed to trade shares to keep my business as it was (8)

Display This Question:
If Q16. How did you respond to the BAP reform? = a. I continued continued in the commercial fishing Industry much as before, or through adjusting my business
Or Q16. How did you respond to the BAP reform? = b. I continued in one or more of my fisheries, but exited one or more of my fisheries
Or Q16. How did you respond to the BAP reform? = c. I entered the Industry by buying my first commercial fishing business (if you already owned a CF business please answer [a])

Q99 Additional comments for above (optional):
_____

Display This Question:
If Q16. How did you respond to the BAP reform? = a. I continued continued in the commercial fishing Industry much as before, or through adjusting my business
Or Q16. How did you respond to the BAP reform? = b. I continued in one or more of my fisheries, but exited one or more of my fisheries

Or Q16. How did you respond to the BAP reform? = c. I entered the Industry by buying my first commercial fishing business (if you already owned a CF business please answer [a])

Q93 Q24. What were the consequences for your business of trading shares?
a. Trading shares **enabled** me to do what I wanted with my business (1)
b. Trading shares **did not enable** me to do what I wanted with my business (4)
c. Trading shares enabled me to do **some things** I wanted to, and others I couldn't (5)

Display This Question:
If Q24. What were the consequences for your business of trading shares? = b. Trading shares did not enable me to do what I wanted with my business

Q94 Q24_b. Why not?
1. I could not afford the number of shares I needed (1)
2. I could not get the shares I wanted/needed (eg, access vs quota shares) (4)
3. The equity value of my business is now lower because I used savings or took on debt to buy shares (5)

Q95 Additional comments for above (optional):
_____

Display This Question:
If Q19. Did you trade in the Subsidised Share TradingMarket? = a. Yes
Or Q22. Did you trade shares outside the Subsidised Share Trading Market? = Yes

Q37 Q25. Have you used savings or taken on debt to buy shares?
a. Yes (1)
b. No (2)

Display This Question:
If Q25. Have you used savings or taken on debt to buy shares? = a. Yes

Q38 Q25_b. How much savings or debt did you have to take?
Under $50,000 (1)
$50,000-100,000 (4)
$100,000-200,000 (5)
Over $200,000 (6)

Display This Question:
If Q25. Have you used savings or taken on debt to buy shares? = a. Yes

Q39 Please give examples, or comment on this investment
_____

Display This Question:
If Q16. How did you respond to the BAP reform? = a. I continued continued in the commercial fishing Industry much as before, or through adjusting my business
Or Q16. How did you respond to the BAP reform? = b. I continued in one or more of my fisheries, but exited one or more of my fisheries

Q48 Q26. Has your fishing business **profitability** changed as a result of the BAP?
No, it is about the same (1)
Yes, I am **more** profitable **after** the BAP (2)
Yes, I am **less** profitable **after** the BAP (3)

Display This Question:
If Q16. How did you respond to the BAP reform? = a. I continued continued in the commercial fishing Industry much as before, or through adjusting my business
Or Q16. How did you respond to the BAP reform? = b. I continued in one or more of my fisheries, but exited one or more of my fisheries

Q101 comments on above (optional):
_____

Display This Question:
If Q16. How did you respond to the BAP reform? = a. I continued continued in the commercial fishing Industry much as before, or through adjusting my business
Or Q16. How did you respond to the BAP reform? = b. I continued in one or more of my fisheries, but exited one or more of my fisheries

Q50 Q27. Did the value of your **business' fishery shareholding** change via the BAP?
Yes (1)
No (2)

Display This Question:
If Q27. Did the value of your business' fishery shareholding change via the BAP? = Yes

Q102 Please explain how it has changed.
_____

Display This Question:
If Q16. How did you respond to the BAP reform? = a. I continued continued in the commercial fishing Industry much as before, or through adjusting my business
Or Q16. How did you respond to the BAP reform? = b. I continued in one or more of my fisheries, but exited one or more of my fisheries

Q54 Q28. Has the BAP altered the **number of people** employed in your fishing business?
No (1)
Yes, **more** people now work in my fishing business (4)
No, **less** people now work in my fishing business (5)

Display This Question:
If Q16. How did you respond to the BAP reform? = a. I **continued** in the commercial fishing Industry much as before, or through adjusting my business
Or Q16. How did you respond to the BAP reform? = b. I **continued** in one or more of my fisheries, but exited one or more of my fisheries

Q103 comments on above (optional):
_____

Display This Question:
If Q16. How did you respond to the BAP reform? = a. I **continued** in the commercial fishing Industry much as before, or through adjusting my business
Or Q16. How did you respond to the BAP reform? = b. I **continued** in one or more of my fisheries, but exited one or more of my fisheries

Q56 Q29. Has the BAP changed the **numbers of hours** you work on your fishing business?
No (1)
Yes, I spend **more** hours fishing **after** the BAP (2)
Yes, I spend **less** hours fishing **after** the BAP (3)

Display This Question:
If Q16. How did you respond to the BAP reform? = a. I **continued** in the commercial fishing Industry much as before, or through adjusting my business
Or Q16. How did you respond to the BAP reform? = b. I **continued** in one or more of my fisheries, but exited one or more of my fisheries

Q104 comments on above (optional):
_____

Display This Question:
If Q16. How did you respond to the BAP reform? = a. I **continued** in the commercial fishing Industry much as before, or through adjusting my business
Or Q16. How did you respond to the BAP reform? = b. I **continued** in one or more of my fisheries, but exited one or more of my fisheries

Q106 Q30. Has the BAP affected your confidence in the future of the NSW commercial fishing Industry?

No, my confidence in the future of the NSW commercial fishing Industry is about the **same** now as it was before the BAP (1)
Yes, I am **more** confident about the future of the commercial fishing Industry now than I was before the BAP (2)
Yes, I am **less** confident about the future of the commercial fishing Industry now than I was before the BAP (3)

Display This Question:
If Q16. How did you respond to the BAP reform? = a. I **continued** in the commercial fishing Industry much as before, or through adjusting my business
Or Q16. How did you respond to the BAP reform? = b. I **continued** in one or more of my fisheries, but exited one or more of my fisheries

Q107 comments on above (optional):
_____

End of Block: Q19-Q30
Start of Block: ECON Q31

Note:
We recommend discarding this question in future iterations of this survey.
The wording of this question was the result of much discussion with government and Industry stakeholders about how we could obtain some kind of data about business value, turnover and/or profitability. Ultimately, however, it did not yield useful data. Based on this experience, and the research team's experience undertaking large economic contributions studies for commercial fisheries in NSW and Victoria (Voyer et al. 2016; Abernethy et al. 2020), we conclude it is not possible to gain useful economic monitoring data on commercial fisheries in Australia from a survey such as this. For recommendations on how effective economic monitoring could be conducted see the section ToR 2.3 Use the survey for ongoing social and economic monitoring that the NSW Government can use to inform decision making.

Q40 Q31. This question is to understand your **gross revenue** for **financial year 2017-18**. Please list the total catch for your main fisheries (up to three) for 2017-18.

Please list average price per kg for FY17-18 if you know it. If you don't remember the average price for that year leave blank and we will use DPI/SFM prices.

	Species Name (7)	kg (8)	Average price per kg for FY17-18 (10)
Catch 1 (5)			
Catch 2 (6)			
Catch 3 (7)			

End of Block: ECON Q31
Start of Block: ECON Q32-Q34

Q58 Q32. Have you **invested** in any of the following in the last year?

	Yes (1)	**No** (2)

i. New IT equipment e.g. computers, software (1)
ii. New fishing equipment other than boats (2)
iii. New boat (3)
iv. Purchasing additional shares in one or more fisheries (4)
v. Other major investment in your business (5)

Q108 comments on above (optional):
_____

Q60 Q33. Fishing businesses are complex and catch/revenue is responsive to many different factors. Thinking of all those factors together, please indicate the extent to which you agree with this statement: 'Overall, I am **satisfied with how my fishing business** is going at the moment'
Strongly agree (8)
Somewhat agree (9)
Neither agree nor disagree (10)
Somewhat disagree (11)
Strongly disagree (12)

Q109 comments on above (optional):
_____

Q64 Q34. Which of the following will most affect your commercial fishing into the future?

	not at all concerned (32)	(33)	somewhat concerned (49)	(50)	very concerned (51)
a. Your ability to access adequate shares (1)					
b. Market demand for fisheries product (2)					
c. Sustainability of fish stocks (3)					
d. 'Social licence' of commercial fisheries (4)					
e. Access to appropriate technologies (5)					
f. Conflict within the commercial fishing Industry (6)					
g. Lack of united voice for Industry (7)					
h. Conflict with recreational fishers (8)					
i. Communication with Fisheries Managers (9)					

j. The health of your regional economy as a result of fisheries reforms (10)

k. Access to fisheries resources (13)

l. Declining ecosystem health due to development (particularly in estuaries and coastal areas) (14)

k. Other issues not listed above (11)

End of Block: ECON Q32-Q34
Start of Block: ECON Q35-Q37

Note:
The questions here used to assess life satisfaction are based on an existing widely-used and validated tool – the Personal Wellbeing Index (PWI) (International Wellbeing Group 2013). The PWI asks about satisfaction with several domains of life and is often preceded by a single question about satisfaction with life overall (Global Life Satisfaction, GLS). As per the tool developer's recommendations we asked the GLS question first, before then asking respondents about the domains of life. We slightly modified the tool, in that we omitted one of the seven questions normally included in the PWI on satisfaction with 'your future security'. This question was felt by stakeholders during our survey design phase to be confusing and unnecessary in the context of our fisheries survey.
Using a validated tool rather than inventing our own questions makes the findings more reliable, and also enables the survey results to be compared with other surveys using the same tools. In particular, it enabled us to compare life satisfaction of NSW commercial fishers with the life satisfaction reported for rural and regional communities in Australia as a whole (Schirmer et al. 2016).
Future iterations of the survey should aim to maintain the ability to compare with other life satisfaction and wellbeing surveys.

Q66 Q35. Thinking about your own life and personal circumstances, **how satisfied are you with your life** as a whole?

no satisfaction at all										completely satisfied
0	1	2	3	4	5	6	7	8	9	10

Q67 Q36. How satisfied are you with the following domains of life?

	no satisfaction at all										completely satisfied
	0	1	2	3	4	5	6	7	8	9	10
a. Your standard of living? (1)											
b. Your health? (4)											
c. What you are achieving in life? (5)											
d. Your personal relationships? (6)											
e. How safe you feel? (7)											
f. Feeling part of your community? (8)											

Q68 Q37. Has the BAP affected your **satisfaction with life**? How satisfied with your own life and personal circumstances as a whole were you in 2014 before the BAP was implemented?
a. I was **much more** satisfied with life in 2014 (1)

b. I was a **bit more** satisfied with life in 2014 (4)
c. I am **about the same** satisfied with life now as I was in 2014 (5)
d. I was **a bit less** satisfied with life in 2014 (6)
e. I was **much less** satisfied with life in 2014 (7)

Q69 comments on above (optional):
_____

End of Block: ECON Q35-Q37
Start of Block: ECON Q38~40

Q71 Q38. How satisfied are you with the contributions commercial fishing makes to the following domains of **community wellbeing**?

	no satisfaction at all 1	2	3	4	completely satisfied 5
a. A year-round source of revenue in the local economy? ()					
b. A source of entry level employment? ()					
c. Supplying fresh local seafood? ()					
d. Supporting community organisations and events? ()					
e. Participating in fisheries or estuary management committees? ()					
f. Synergies with tourism through providing fresh local seafood, giving people the experience of watching boats unload, etc? ()					
g. Synergies with recreational fishing and boating through bait provision and shared services for ice, fuel etc? ()					
h. Helping out boaters in trouble? ()					
i. Sense of place and identity as a fishing town for community members? ()					

Q110 comments on above (optional):
_____

Q72 Q39. Did the **BAP affect** the contributions commercial fishing makes to **community wellbeing**?
a. Commercial fishing made **much greater** contributions to community wellbeing in 2014 (1)
b. Commercial fishing made **slightly greater** contributions to community wellbeing in 2014 (4)
c. Commercial fishing made **about the same** contributions to community wellbeing in 2014 (5)
d. Commercial fishing made **slightly less** contributions to community wellbeing in 2014 (6)
e. Commercial fishing made **much less** contributions to community wellbeing in 2014 (7)

Q111 comments on above (optional):
_____

Q66 Q40. How has BAP impacted the **environmental sustainability** of your fishery, if any?
Yes, strongly negative impact (1)
Yes, somewhat negative impact (2)
No perceivable impact (3)
Yes, somewhat positive impact (4)
Yes, significantly positive impact (5)

End of Block: ECON Q38~40

Appendix 5 – Survey response details

These start on the following page.

UTS Institute for Sustainable Futures