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Completing Australia's First National Bycatch Report
FINAL REPORT

Steven J Kennelly
IC Independent Consulting

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Executive Summary

Bycatch (non-targeted organisms that are unintentionally caught when fishing for particular species or sizes of species) remains one of the most important issues concerning the world's fisheries. And discards are considered the most important component of bycatch because they represent a perceived wastage of seafood resources, include Threatened, Endangered and Protected species (TEPS), and attract significant interest and controversy from many stakeholders. There is now growing acceptance and international, regional and national agreements and instruments that encourage and/or require governments to report on the status of bycatches.

This report that arose from this project and its precursor "Developing a National Bycatch Reporting System" (FRDC Project 2015-208) constitutes Australia's first national attempt to report on bycatch from its commercial fisheries. It is the result of the application of a 5-step methodology developed in the first project.

The results delivered three new pieces of information about Australia's commercial fisheries during the decade 2010-19: (i) estimates of discards by fishery, method, jurisdiction and nationally; (ii) a summary of information about fisheries' interactions with TEPS; and (iii) estimates of the quality of the information used to generate (i) and (ii).

This study required many assumptions when extrapolating the limited number of empirically derived discard ratios by total retained catches to obtain estimates for individual fisheries, methods and jurisdictions. Very often surrogate ratios from other, similar fisheries/methods from the same or other jurisdictions had to be used - an unavoidable problem for those fisheries/methods where there are no observer data or other ways to estimate discards.

Notwithstanding these shortfalls, the quantity and quality of discard ratios available enabled a reasonably robust estimate of the level of discards occurring throughout Australia's 8 fisheries jurisdictions. Overall, during the last decade, Australia's commercial fisheries were estimated to have annually discarded 37.6% (SE 4.3%) of what was caught or 92,368t (SE 10,661t). Whilst this rate is quite high compared to, for example, the USA's 17% for its federal fisheries, it is significantly less than the 55.3% estimated for Australia by FAO's 2nd global decadal report and similar to the 39.8% in FAO's most recent database. This suggests that, over the past 20 years,

Australia's commercial fisheries have significantly reduced their discards although, the latest estimate of 37.6% still leaves room for improvement.

The data showed that 71.2% of all discards came from just 9 fisheries/methods with the remaining 298 fisheries/methods contributing 28.8%. Clearly, effort to reduce discards further in Australia should focus on the former few fisheries/methods and in particular on the Queensland East Coast Prawn Trawl fishery which alone contributed 27.1% of all of Australia's discards. Of the other 8 highest discarding fisheries/methods, 5 are also trawl fisheries - the Commonwealth's Northern Prawn and Southeast Trawl fisheries, and NSW's and South Australia's Prawn Trawl fisheries – an expected result as prawn trawling is well-known as the least selective fishing method in the world. A significant amount of research has occurred (particularly in Australia) to modify these methods so that they fish more selectively. But despite this, our results suggest that there remains significant work to be done in this area - especially in the implementation of already developed technologies.

Two other high discarding fisheries are the Western Australian and Tasmanian Rock Lobster fisheries - perhaps the most surprising result from this study. Most would consider lobster trapping as a reasonably selective method yet this study estimated that 47.6% and 77.9% of catches are discarded in the above fisheries, respectively. But it is important to note that most of these discards are undersize (and/or berried female) lobsters – which are believed to have very high survival rates after discarding - so the actual impact of such discarding on populations is likely to be minimal.

In addition to the above observations, two other key findings were: (i) the Northern Territory showed the lowest levels of discarding of all of Australia's jurisdictions - just 14.6%; and (ii) Australia's Commonwealth fisheries had the best discard data of all Australia's jurisdictions due to the availability of information from AFMA's long-running observer (and more recent) Electronic Monitoring (EM) programmes. The Commonwealth's data also allowed a comparison that showed that fishers' logbook information under-estimated levels of general discards (as estimated from observer data) by 87.7% - confirming the often-stated but rarely-proven assertion that self-reported information from fishers about discards do not always reflect true levels.

Whilst this study produced reasonable estimates of general discards for most fisheries and methods in Australia, the same cannot be said for interactions with TEPS for 7 of Australia's 8 jurisdictions. The exception was the very good information available from Australia's Commonwealth observer programmes which permitted reasonable extrapolations about TEPS interactions to a fishery level. The results showed that 106 TEPS were recorded by observers over a 9 year period at an average of 37,616 interactions per year (with 61.7% animals released alive). And the largest number of these interactions occurred in trawl fisheries with the Northern Prawn fishery recording by far the most (52% of all interactions) – the majority of which involved sea snakes (with 65.3% released alive).

The Commonwealth's TEPS data also allowed a comparison that showed that fishers' logbook information under-estimated TEPS interactions (as estimated by observer data) by 60.4% - much better than the under-reporting rate for general discards. Further, this situation has improved in some Commonwealth fisheries in recent years due to the implementation of the EM programme.

The application of the US Tier Classification system for scoring the quality of bycatch information to Australia's data yielded quite reasonable quality scores for general discards across most jurisdictions with an average weighted national score of 57.6%. The best performing jurisdiction was the Commonwealth (69.9%). Jurisdictions with at least some observer data (especially those that cover high discarding fisheries/methods) also scored well (NSW, Northern Territory, Tasmania and Queensland) whilst Victoria, South Australia and Western Australia scored the lowest due to their scarcity of observer data and the need to use many surrogate rates from other fisheries/methods/jurisdictions. For TEPS interactions, quality scores were far worse - a national average score of just 10.8%. The exception was for Commonwealth fisheries with a score of 49%. – again due to the observer and recent EM programmes.

In providing the above information, this report has yielded: (i) a baseline to be used by Australia in the future to track performance in managing discards, TEPS interactions and the quality of its bycatch information; (ii) the identification of key gaps in information where future work to monitor and reduce discards should focus; and (iii) a methodology that may be used by other countries and jurisdictions to estimate and report on bycatch to various entities and processes including stock assessments, Ecosystem-based Fisheries Management initiatives, FAO's Code of Conduct for Responsible Fisheries, assessments by eco-labelling organisations, the EU's Common Fisheries Policy and its Landing Obligation, as well as the most important stakeholders of all – the perpetual owners of all fisheries discards and TEPS – the general public.

Introduction

Bycatch still dominates fisheries management, policy and science, being a major component of many jurisdictional fisheries management plans and stock assessments as well as international initiatives such as Ecosystem-based Fisheries Management, the UN FAO's Ecosystem Approach to Fisheries Management and Code of Conduct, assessments by eco-labelling organisations, the European Union's (EU) Common Fisheries Policy and its Landing Obligation, and a host of other state, national, regional and global instruments. And in recent years, the importance of bycatch monitoring and reporting has been recognised in a variety of international agreements, guidelines and policies.

The only nationally consolidated estimates of bycatch for Australia are those contained in FAO's two most recent decadal reports: Kelleher (2005) estimated that Australia's commercial fisheries discard more than they retain (i.e. 55.3%) whilst examining Pérez Roda, et al.'s (2019) database provides an estimate of 39.8%. Such figures may surprise many (including fishing industries, environmental groups and those concerned with seafood security) and has the potential to adversely affect Australia's well-earned brand as a responsible fisheries management nation. But both these estimates are problematic as they incorporated very few empirical estimates of bycatches from Australia's fisheries.

This project and its precursor "Developing a National Bycatch Reporting System" (FRDC Project 2015-208) led to "Australia's First National Bycatch Report" (appended to this document). It constitutes the first attempt to exhaustively obtain, estimate and report bycatches for all

Australia's commercial fisheries and also provides estimates of the quality of the data used to make such estimates.

Objectives

1. Collect, synthesis and analyse catch, effort and bycatch data from the Commonwealth, Victoria, South Australia and Western Australia
2. Derive bycatch estimates for general discards and ETP species, with associated variances and quality metrics for each jurisdiction
3. Combine the estimates from 2 above with those from the previous project to produce Australia's first National Bycatch Report

Methods, Results, Discussion etc.

Details regarding all aspects of this project are contained in the project's chief output "Australia's First National Bycatch Report" which is appended to this document in the below section "Project materials Developed".

Recommendations

The work done in this project and the previous project (Kennelly, 2018 – FRDC 2015/208 highlighted several areas where improvements can be made in how to monitor and report on bycatches and discards in Australia's commercial fisheries:

- Future bycatch monitoring programs in Australia should: (i) focus on getting at least some data from fisheries where we have no discard data at all; (ii) but mainly concentrate on particularly problematic and non-selective fishing gears (such as trawling), with (iii) less focus on those gear types that have been identified as having relatively few discards. This is not to say that we need lots of ongoing (and often expensive) observer programs, but strategically-located and -timed programs that examine certain fisheries periodically. Such a system of "rolling" observer programs will greatly improve the quality of discard information for Australia at a more modest expense. Alternatively, the use of camera technology to audit industry reported information is proving to be an adequate (and cheaper) way to obtain such information.
- Substantial effort needs to focus on better ways to monitor interactions with TEPS, perhaps by embracing current work occurring in the field of Electronic Monitoring using cameras to augment, audit and so improve industry-based reporting.
- Efforts to reduce discards should focus on those fisheries identified as having particularly high discards (in this study, oceanic prawn trawling and lobster fisheries) by developing more selective gears, better handling practices, better implementation of existing modifications and/or other management actions like reductions in fishing effort.

Conclusions

This project has provided the first assembly of baseline information and metrics about bycatch in Australia. It is anticipated that subsequent reports (perhaps every decade or so) will be done to track our 8 jurisdictions' progress in managing and reporting on such issues. The work has also

identified the key gaps in our information and where future work in this field should focus (see above “Recommendations”).

By examining the bycatch information available for Australia’s fisheries jurisdictions, this study (and the previous project) developed a methodology by which any jurisdiction, in any country, can compile, summarise and report on discards and TEPS interactions in their fisheries. This methodology involves a relatively simple, five stage process that yields estimates of rates and annual quantities of discards (with associated variances) for the jurisdiction and the various fisheries within it, in addition to estimates of the relative quality of the information used. Such an approach will enable jurisdictions to periodically report to their numerous audiences on the status of bycatches in their fisheries and the quality of the information used to determine it.

Implications

This project and its methodology allows Australia’s fisheries jurisdictions to periodically report on the status of discarding in their fisheries (and the quality of the information used to determine it) to its public and other stakeholders including international agencies, agreements, instruments, eco-labelling initiatives, etc.

The work done also identifies those areas where future work on discards in Australia should focus in terms of reporting, monitoring and reduction. That is, to better estimate discards empirically and resolve many of the assumptions made, more strategic use of observer programs and/or Electronic Monitoring is required (the latter in particular for estimating TEPS interactions). But such programs are not necessarily needed for all fisheries, all the time – but mainly for those fisheries that have been identified as having quite high levels of discards (such as trawl fisheries). Further, this project has identified those fishing methods where, despite decades of research, still more work is needed to reduce discards.

Extension and Adoption

The main target audience for the work done in this project is Australia’s fisheries jurisdictions and individual fisheries that wish (or need) to quantify and report on discards and TEPS. Other users of the information may be jurisdictions and fisheries in other countries as they also seek ways to do the same.

Of particular importance will be the examination of this project by the Australian Fisheries Management Forum and the 8 fisheries jurisdictions of the country as they consider implementing (or not) the bycatch reporting system developed here as a periodic (perhaps decadal) feature of fisheries reporting.

Other avenues for the dissemination of this report will be on appropriate websites to ensure that the information is made available to the general public (the actual owners of fisheries’ discards). It is also intended to publish parts of this report in the mainstream scientific literature as one or more journal publications.

Project Materials Developed

The chief output from this project was “Australia’s First National Bycatch Report” which is attached.