

# Discussion of Session I

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## Chaired and recorded by Nick Rawlinson

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Each presentation was followed by a time for questions, after which the session was opened for more general comments and discussion.

Following *David Brewer's* presentation, Ian Poiner (CSIRO Marine Research) mentioned that in addition to the author's coverage of bycatch-related research in the Northern Prawn Fishery (NPF), the Australian Fisheries Management Authority (AFMA), Bureau of Resource Sciences (BRS) and the Commonwealth Scientific and Industrial Research Organisation (CSIRO) were updating the present baseline of turtle catches in the fishery. He added that AFMA was monitoring and recording the uptake of modified fishing gear and new technologies in the NPF. This monitoring process was seen as vitally important not only for this fishery but also for other Australian fisheries. He commented that the presentation had concentrated on two important aspects of bycatch: first, the level and nature of bycatch, and secondly the fate of the discards. However, major issues that were becoming increasingly important in trawl fisheries around the world and the NPF, were non-retained bycatch and physical changes to the seabed. He asked David Brewer to comment on future research and development within these areas for the NPF.

David Brewer replied that to date very little research had been done in these areas in the NPF. However, there was a large research project on the Great Barrier Reef that had investigated the

effects of trawling on benthic communities. This research primarily investigated the 'unseen' bycatch. As this issue had received less publicity, it has had a lower profile and had therefore received less attention in terms of research. He added that CSIRO was currently investigating the impacts of trawling on species biodiversity in the NPF. The species compositions of catches from trawled and protected areas were being compared. The numbers of vertebrates, invertebrates and benthos were being quantified.

Stewart Frusher (TAFI) commented that Ian Munro had carried out studies in the Gulf of Carpentaria prior to the opening of the NPF. This work had shown that there were large communities of sponges in the Gulf. Stewart Frusher asked whether anyone had followed-up on the work undertaken by Munro.

David Brewer mentioned work by Rainer and Poiner, although he was not exactly sure what type of data were available. He noted that historical data were vitally important for comparative purposes and assessing changes over time.

At the end of the presentation by *Julie Robins*, David Brewer stated that intensive trawling had been carried out in the Moreton Bay for many years and that crustaceans dominated the bycatch in this fishery. He asked Julie Robins whether the bycatch composition within this fishery had changed over the years.

Julie Robins stated, with some reservation, that the catch composition within this fishery had changed over the years. Endeavour prawns dominated catches nowadays although tiger prawns used to be more prolific. She also referred to previous work by Wassenberg and Hill, which showed sand crabs were a major scavenger of bycatch. She then postulated that the high level of discards in this fishery may have provided more food for sand crabs and boosted their numbers over time. The relatively high bycatch levels of sand crab today reflect this.

David Brewer remarked that changes in the composition in bycatch over time was a very important issue and suggested that the participants of the workshop give this some consideration.

After the next presentation, Murray MacDonald (Fisheries Victoria) stated that *Ian Knuckey's* talk focussed on finfish bycatch and asked why invertebrate bycatch, particularly epibenthos, was not mentioned. Was it because invertebrate bycatch is not a problem in this fishery? Or was it because there was a lack of evidence to make a judgement on this subject?

Ian Knuckey replied that it was mainly due to epibenthos accounting for a relatively small proportion of the catch. He continued by adding that despite invertebrates and epibenthos representing a small amount of bycatch in terms of weight, this catch did consist of a large number of species. However, fish was by far the largest component of the bycatch in the South East Fishery (SEF).

Murray MacDonald asked whether the physical impact of trawling on bottom habitat was seen as an important factor in this fishery.

Ian Knuckey mentioned that CSIRO was undertaking a large project looking at the ecological impacts of trawling. However, trawling

in the SEF had been carried out for many years, suggesting these fishing grounds would have already been modified. He added that BRS were mapping the area of the fishery that is subjected to trawling and was trying to pinpoint the areas subjected to the greatest trawling pressure. Results to date suggested that only a small percentage of the total area encompassed by the fishery was trawled.

Malcolm Haddon (AMC) stated that *Geoff Liggins's* presentation concentrated on redfish and showed this species has a high discard rate. He asked what the impact would be on subsequent stock assessments of other species with lower discard rates and if the actual level of discarding was unknown

Geoff Liggins replied that this would not be an issue for species with low discard rates. Redfish had been chosen as a consistent example to show the size distribution of the discards and how they dominate the catch. In fact, similar trends in size distributions are observed with other species including mirror dory, the inshore and offshore varieties of ocean perch in New South Wales and blue grenadier. Geoff then added that for each of these species it is important to include discards in stock assessments. He reiterated that redfish is not the only species for which this occurs and it was chosen as an example to make this important point.

Richard Tilzey (BRS) made the observation that there had been flow-on effects to discarding brought about by management measures. Since the introduction of ITQs to this multi-species fishery, there had been a shift away from target fishing for individual species, except those that seasonally aggregate, e.g. orange roughy and blue grenadier in the winter. The move towards taking a much more mixed catch allows fishers to spread the quota over the year, which steadies supply and yields better prices. He added that whether this new fishing strategy had resulted in more bycatch was unknown because it had not yet been quantified.

Derek Staples (BRS) asked for some clarification on whether the research program Geoff Liggins had described was set up for carrying out stock assessments since he had implied that the information was being used for other purposes.

Geoff Liggins replied the catch information was being used for stock assessment purposes and that in his presentation he was underlining the importance of including catch discard information in stock assessments. Discard information for redfish has definitely been included in recent assessments by Kevin Rowling and Kay Radway-Allen, and routinely included for blue grenadier and blue warehou, as well as the status reports produced for the SEF. He was just highlighting the importance of the monitoring program to collect this information. To emphasise this point, Geoff Liggins showed a graph of redfish to highlight a striking change in size distribution over a five-year period, which would not be noticeable if discard information had not been included. He stated that without including the discard information, a major component of the mortality from the fishery would be excluded.

Colin Buxton (TAFI) asked why there were fewer smaller fish in the fishery nowadays and whether this was due to changes in fishing gear.

Geoff Liggins replied that across the time period shown it appears to be simply a function of recruitment, as there had not been major changes in the spatial distribution of fishing effort (both in terms of area and depth) over the five-year period. It could be that environmental factors have influenced the distribution of that size group but it is most likely due to recruitment.

After the presentation by *Dennis Heinemann*, Albert Caton (BRS) stated that in the 1980s the Taiwanese carried out a significant amount of drift netting in the Indian Ocean, and then subsequently shifted to the Pacific Ocean.

He asked Dennis whether this drift net fishing could have had an impact on albatross numbers.

Dennis replied that this was quite possible. However, due to a lack of data on the Taiwanese fishing activity there were no estimates of the actual level of fishing effort in this region and no estimates of bycatch rates. This was unlike the Japanese fishery from which detailed information had been collected through the observer program.

Ian Poiner asked if there was an explanation for the 28% increase in population sizes of albatross in the Croset Islands. Dennis Heinemann stated that he was not sure if this increase in population was sustainable. For most of the seabirds the breeding area is limited and since large numbers of adults have been removed from the population, younger birds had been reproducing, resulting in an increase in the number of breeding pairs. As population counts are based on the number of breeding pairs, and since the increase in numbers reported is due to breeding pairs recruiting at an earlier age, there is going to be a limit to how long this can continue. If this was true, we could expect the population to level off or maybe even decline again.

Ian Poiner asked whether this rise in population numbers could have been related to any mitigation measures. Dennis Heinemann replied they could not be related at the levels recorded.

After *Stewart Frusher's* presentation, Paul McShane (SARDI) said that one of the problems in South Australia was the predation of rock lobster by octopus. According to Stewart's data, the use of escape gaps in pots reduced octopus bycatch to zero. Paul then queried how the figure of 100% reduction in octopus bycatch related to the level of predation by octopus in that fishery.

Stewart Frusher replied that octopus remained a problem in the Tasmanian fishery and annually accounted for A\$1-2 million worth of product.

It was greatest in stick pots, perhaps because this was a less hostile environment and the octopus stay inside the pot for longer periods. It may also have to do with the number of lobsters in the pot. Octopus are attracted by the bait first and then they will attack the lobsters, usually the largest first. This causes panic amongst the remaining lobsters and they start to shed legs etc. There was a big reduction in the number of octopus in the pots that had escape gaps all around but not those with only two escape gaps.

Bruce Wallner (AFMA) stated that Stewart Frusher had portrayed an overly bleak picture of the bycatch in lobster pots by making statements such as "they all die because they have swimbladders". He pointed out that not all bycatch species (crustaceans and sharks) experience this trauma and that no data were presented on the real mortality rate of shallow-water species with swim bladders such as wrasses. Bruce then suggested that a lot of the bycatch may be returned alive and survive the ordeal. He asked Stewart to comment on this point.

Stewart Frusher agreed that crustaceans would be returned alive. Sharks were a minor component of the bycatch but some draughtboard sharks, cat sharks and sting-rays were caught. Fish were the most dominant component of the bycatch and some of the wrasse were hauled up from 10-30 metres. When wrasse and leatherjackets are hauled from these depths they generally show signs of barotrauma. However, Stewart Frusher agreed that he did not believe there was a major bycatch problem in this fishery as mandatory escape gaps in pots had proven to be very effective in excluding bycatch.

Bruce Wallner asked if these trends were the same across other lobster fisheries.

Stewart Frusher said that he did not know, and that he had found it very hard to find other people

who have collected information on bycatch in lobster fisheries.

Duncan Leadbitter (Ocean Watch) posed two questions to *David McGlennon*. First, did he perceive the retention of juvenile fish as a bycatch issue, and second, whether the entanglement of wildlife such as pelicans caught in lines and turtles taking hooks was a problem.

David McGlennon said that the juvenile (undersized) fish had been included in the harvest data in his presentation. In response to the second question he stated that in South Australia the entanglement of wildlife had not been a major issue, and he considered this to be a greater problem in game fisheries where live-baits were trolled.

David Brewer asked whether discard mortality, especially for juveniles, was a critical issue in recreational fisheries.

David McGlennon replied that there was a reasonable amount of literature on hooking mortality that was relevant to recreational fisheries. However most of the literature stated huge variation in the figures from these experiments. It was very hard to experimentally mimic an 'average' recreational fishing activity and therefore he was critical of some of these experiments even though there is a large amount of literature on the subject. At the individual fisher level, it depended very much on the level of care given by the fisher.

Malcolm Haddon stated that dolphin capture in set nets was a big problem in New Zealand. He then asked David McGlennon to comment on this from an Australian perspective. Malcolm then questioned David further on whether marine mammals getting caught in passive nets was an issue in Australia.

Jeremy Lyle (TAFI) responded on behalf of David McGlennon in relation to Malcolm's second question. Jeremy stated that as far as he was aware there were no reports of dolphin entanglements in recreational fishing gear in Tasmania and if this had been the case the stories would have certainly made the press. However, stories of bird entanglements e.g. herons and diving birds in the river, do make the press. Alerts are published in the newspapers to ask recreational fishers to leave their nets out of the water when the mutton birds are in the river feeding on krill. However, he did not have any hard data on the level of entanglements.

Colin Buxton mentioned that past studies on recreational fisheries in South Africa had shown that there was a lot of selective grading going on. Anglers would have a tendency to keep all the fish they had caught during the day, but then only take home the five largest in a bag, the remainder of the catch being discarded or shared out amongst others. He asked David McGlennon whether this was a problem in Australia.

David McGlennon stated that this did occur in Australia but he had no idea of the extent of the problem. He continued that it would only be an issue in fisheries where there were bag limits on particular species. Up to the present time it had not been a major issue and he had not regularly seen this practice.

The chairman thanked all speakers and participants for their contributions.