

Discussion of Session 2

Chaired by Murray Johns

Department of Primary Industry and Energy
Canberra ACT 2600

Recorded by Kerry Truelove and Aubrey Harris

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Murray Johns thanked the workshop convenor and recalled that papers heard in the morning sessions reminded all of the extent of the problem. There were numerous photos of bycatch and sometimes it was difficult to spot the prawns especially with ratios of up to 20:1 *bycatch to the target species*.

Following the presentation by *Aubrey Harris*, Malcolm Haddon (TAFI) noted that management had only recently started taking into account discards as had been defined today. He asked if it was a realistic expectation for any work to be done on other sources of mortality. Included were unobserved mortality during escape from nets and subsequent death of live discards.

Aubrey Harris replied that there had already been work done in Australia and elsewhere on unobserved mortality. For example, there had been work on the mortality due to lost gear in the South East Fishery and the mortality of fish escaping through prawn trawl nets in the Northern Prawn Fishery. It would be addressed depending on the priorities and issues in particular fisheries. He had been in an international technical consultation two years

previously where unobserved mortality was raised as an important bycatch issue by Frank Chopin, previously of the Australian Maritime College. Frank knew of several fisheries where the extent of unobserved mortality could be as high as the observed mortality. Aubrey considered that unobserved mortality was an issue and it had to be dealt with.

Lindsay Joll (Western Australian Fisheries) mentioned that Aubrey hadn't touched on what he called the psychology of bycatch, that is, it seemed to be okay if something moved from a discard to an incidental catch. There seemed to be a belief that a dead fish that was eaten was better than a dead fish that was thrown over the side.

Aubrey thought that this was an interesting point. He agreed that it was better to eat a dead fish than to discard it.

Murray MacDonald (Fisheries Victoria) stated that we seemed to be restructuring the English language in order to suit the whims of politicians and bureaucrats. Surely the word "catch" meant what it said: the fish that were taken, whether discarded or kept. The other

undefined mortality was fish that weren't caught, but which died as a result of things such as ecosystem changes – and which had nothing to do with catch. We should, surely, retain standard English definitions and if we wanted to refer to these other sources of mortality then we should find some other definition for them.

Aubrey Harris clarified that the unobserved mortality related to the fishing effect of the gear on the animal. From the definitions of bycatch adopted by the OECD, the National Marine and Fisheries Service, and the FAO there were clearly general concerns that had led to the inclusion of this component of mortality as bycatch. The broadening definition was a sign of the times and the concerns.

In response to *Ilona Stobutzki's* paper, Bruce Wallner (AFMA), acting as a devil's advocate, asked whether we should spend a lot of money doing this sort of species response work, or should we take a different tack and convince the Australian public that fishing was like wheat farming, with consequences that have to be accepted as part of this primary industry.

Ilona Stobutzki said that she wasn't sure that the public would be convinced and it could be costly for industry to depend on this approach. With the approach taken in the NPE, she thought there was a lot better chance of convincing the community there are some species that can sustain fishing and that the situation was not as bad as reflected on TV or on emotively graphic slides. On balance it was not as bad as it looks.

Bruce Wallner said that his concern as a manager was that once the path of cataloguing species responses was started, it may be seen as unsatisfactory to demonstrate that some species are sustainable. There would always be the argument that unless you've catalogued

everything there will be some species that really aren't sustainable.

Ilona Stobutzki agreed with this.

Ian Poiner clarified that the approach presented by Ilona takes care of the management fears. He agreed that it would not be possible to determine the sustainability of some 500 species based on a traditional fisheries approach. What had been presented was a way of examining the status of particular species such as turtles or sea snakes, and whether they really had a sustainability problem. He didn't think that the wheatfield approach would be accepted especially in the face of some species, for example loggerhead turtles, going along the path of severe depletion.

On a technical question of the presentation, Bob Miller (AFMA) wanted to know if the depletion rate was based on a pre-survey study of the abundance of the flora on the seabed, on the biota on the bottom or if it was a relative decline in the numbers of observable bycatch. Ian Poiner clarified that it was based on monitoring with a range of sampling devices from fish trawls, prawn trawls, dredges, videos, drop cameras and acoustics. So, there was a range of sampling data that allowed the measurement of real mortality of even those species not retained as bycatch. One of the issues that had to be taken into consideration is that a prawn trawler is a very inefficient sampler of most of these benthic species.

Duncan Leadbitter (Ocean Watch) commented that where the boundaries were drawn in a managed area is important and wanted to know if Ilona had overlaid the IMCRA bioregions on the area investigated.

Ilona Stobutzki agreed with this. Her recent examination of the IMCRA bioregions in the

NPF indicated that the smallest bioregion had the highest proportion of trawling at 60% of the area. Areas with the highest effort were about 40% and there were bioregions that weren't trawled at all. At a bioregion level, she thought none seemed heavily impacted, though she reserved judgement on this.

Colin Buxton (TAFI) wanted to know if there was any correlation between the catch of prawns and the degradation of habitat. Were fishing effects working in concert with habitat effects?

Ian Poiner (CSIRO Marine Research) responded that in the NPF fishery, one could argue that despite some concerns about current levels of effort, it had been sustainable as a fishery for 20 or 30 years. What was currently coming out of some of the work looking at the fine scale distribution of effort in relation to bottom habitats were some interesting patterns of areas that were unfished for a variety of reasons. Adjoining heavily-fished areas have high catch rates so there is a likely habitat relationship in the fine scale distribution of effort which had been found to be much more aggregated than previously thought.

After the presentation by *Paul McShane*, Colin Buxton (TAFI) wanted to know what effect prawn trawling had on seagrass, since it was important as a primary source of carbon, and there was an implication in Paul's talk that the discards would effectively substitute for a loss of seagrass.

Paul McShane replied that there was no direct effect on seagrass, and prawn trawling didn't occur near seagrass beds, at least to the extent that it caused physical damage. He had considered seagrasses merely because they might be the primary drivers of the whole system. In that case, processes that are detrimental to seagrass – such as land runoff,

pollution, land management activities – would flow through and have a negative effect on the prawn industry. Establishing these ecological linkages would allow us to start to understand what sort of human perturbation influenced the ecosystem. The attention has tended to concentrate on the prawn trawling activity itself, rather than realising that prawn trawling activity occurs in an ecosystem subject to fairly profound land-based activities, which would influence the activities and the health of those fisheries.

Ian Poiner wanted to know if Paul had considered whether the discard material was going to have much of a trophic influence on the system given the relative low levels of bycatch, square mesh codends which would halve the discards leaving about 2,000 tonnes of which a fair bit would consist of crabs that survive. Even in the very high bycatch areas of northern Australia, the amount of material that actually gets to the bottom is in the order of grams per metre square per year.

Paul McShane didn't think that the discard levels would modify the fluxes very much but the environmental performance of South Australian prawn fisheries was not the particular concern. The reverse was the case since he was quite excited about promoting the management practices that currently apply in that fishery. He thought the opportunity existed to actually get to grips experimentally with some of these processes because of the physiography of Spencer Gulf. An option would be to exaggerate the signal so that it could be measured in relation to the natural perturbations in that system, providing an opportunity of a natural laboratory to get a better understanding of the system and perhaps other ecosystems with similar sorts of fisheries. He considered it fair to say that we've got a very, very poor understanding of the trophic consequences of

prawn trawling, or indeed any prawn or trawl activity. There was a need to get to make more informed judgements and comments about the influence of commercial fishing in relation to the marine environments of Australia.

Aubrey Harris (BRS) was interested in Paul's comment that the discards went directly to meiofauna, and eventually to the prawns, and his reference to Gulf of Mexico studies. Studies undertaken in northern Australia showed that prawn trawl discards were quickly eaten by scavengers instead of going to meiobenthos. The ecosystem model used by Browder in the Gulf of Mexico had not been based on a study of the fate of the discards as undertaken in Australia. Were there particular considerations present in the Gulf of Spencer that would suggest this more direct path or was it based on the discard literature?

Paul replied that there weren't, but that he was looking at broadening the focus to include other trophic linkages in the system. If discards were eaten by crabs or other scavengers, then that was an obvious fate. He was also interested in those other animals that rotted, were degraded, or were stirred up by trawling and what effect these had on existing pathways such as the carbon pathway through seagrasses that provides material ending as food for prawns, or fish, or crabs. Though it's likely that this signal may be relatively low compared with other activities that drive the system, the significance of its effect still has to be established in South Australia.

Thanking *Malcolm Haddon* for his talk, the chairperson suggested that one conclusion coming out of the talk was the need for more research.

Patrick Houghton (MAFRI) drew Malcolm's attention away from modelling and remarked that a difficulty was the perception that the

bycatch problem was greatest in years with large recruitment effects. In the King George whiting fishery in Port Phillip Bay, where they had only four year classes in the fishery, when a big pulse of one-plus fish was caught as a bycatch, it was very visible and created much negative publicity. Public perception was perhaps an area that needed to be addressed in big recruitment years, rather than stock assessment.

Malcolm Haddon agreed that public perception needed to be addressed and that was what stimulated him to look at this particular obvious issue for the blue grenadier. There was need for a public relations exercise to demonstrate that the loss was just a few grains by the side of the road compared with what was really out there. That was hard to do and technical modelling was not the only way but it could be a positive and scientific way of assisting the public come to that conclusion.

Elkana Ngwenya (Australian Maritime College) pointed out that, as with the African elephant, there may come a time when recruitment levels of protected species are very high and a form of culling might be necessary. He asked whether public opinion would ever accept such a scenario.

Malcolm Haddon admitted he had avoided the problem in his modelling by focussing on juveniles and noted that, even when recruitment was smaller, bycatch didn't seem to have an effect in the model. He noted that a species like the Irish skate in the Irish Sea, which was a bycatch species in a fishery targeting short-lived, rapidly-growing flatfish, appeared to have gone extinct.

Marc Wilson (Australian Maritime College) suggested that perhaps one aspect that could be changed in the model would be to look at differences in the catchability of juveniles.

Malcolm responded that he could certainly force his model to become significant by changing such assumptions but whether it would be plausible was another matter.

Ian Knuckey (MAFRI) highlighted the density dependence aspect of the model in view of huge recruitment events.

Malcolm considered this a good point and remarked that he had taken a very conservative view. Normally fishing mortality was greater in the older age classes, and density dependent effects on growth rates of large groups, smaller. Despite trying hard to say it was bad, he couldn't get a bad answer. It seemed the little fishes were good at responding in the way needed to recover.