

DISCUSSION OF SESSION 3

Recorded by G.A. Thorncraft

Fisheries Research Institute
P.O. Box 21
Cronulla NSW 2230

Each presentation from the panel was followed by a brief period for questions, after which the floor was opened for general discussion.

Following *Ian Poiner's* presentation, Campbell Davies asked how quickly the seagrass beds recovered after cyclone damage. Ian Poiner replied that recovery of the seagrass beds to their former area may occur in ten years, but recovery of the fisheries was another matter.

Duncan Leadbitter suggested that management of seagrass beds for prawn fisheries was a classic case of *single species management*, and asked how a more holistic ecosystem approach to management may differ? An ecosystem-based approach was definitely needed according to Ian Poiner, with the qualifier that a fisheries' perspective to management should be maintained to ensure the fishing industry is not disadvantaged under an ecosystem approach to management.

Stan Moberly suggested to *Stephen Swales* that rehabilitation was a step in the right direction, but that not messing it up in the first place was preferable. Stephen Swales agreed that proactive measures are desirable, but depending on the situation one has to be proactive or reactive.

Murray MacDonald was concerned that habitat restoration was being seen as an approach that legitimises continuing degradation of habitat and asked whether we ought to be pushing this technique? Stephen Swales agreed that restoration was a last resort and that we should

promote proactive measures wherever possible, but given the reality of the situation we have to be prepared to have tools available to mitigate impacts of development on fish habitats.

George Paras commented to *Mick Bales* that biomanipulation models to establish desirable fish communities were overly simplistic because of the complex interactions between prey groups at lower trophic levels. Mick Bales replied that this was one of the reasons why it is difficult to predict the outcome of any biomanipulation exercise with accuracy.

Karen Edyvane asked Mick Bales if he had thought about modelling physical processes along with the food web information. He responded that he thought other people had tried it, but he hadn't modelled physical processes himself.

Hugh Cross likened the example *Rick Morton* presented to a management experiment and suggested that it is often advantageous to manipulate a system and see how it responds. While this example covered the responses of the Tweed estuary, he questioned whether there had been a change in sand distribution either upstream or farther up the coast? Rick Morton answered that there were four components to the study which addressed water quality; estuarine flora-fauna; terrestrial flora-fauna; and social economics. The social economics study looked at the demand for sand over the long term and took into account such things as stock piling sites and the impact of extra traffic resulting from sand extraction.

John Glaister asked whether the study addressed more northerly habitats which had been degraded by the prevention of sand migrating up the coast? Rick Morton responded that the entire problem lay in the design of the breakwaters, and that sand would continue coming into the Tweed estuary until a bypass system was constructed to allow currents to transport sand farther north. Until that time, the need for 'remedial' dredging of the estuary will continue. The current dredging plan assumes that a sand bypass system will be put in and the channels are all dredged to an equilibrium situation so they should not accrete or erode in any areas.

The *general discussion* started with Jim Puckridge commenting that temporal variability was an important issue particular to Australian rivers and was a major factor in structuring fish communities. He asked Stephen Swales about approaches to restoring temporal variability to the hydrological regime. Stephen Swales replied that natural variability was a component of the environmental flow program he was working on to design suitable flow regimes for the regulated rivers in NSW.

Peter Jackson asked Stephen Swales if he saw value in the concept of having a volume of the impoundment allocated to environmental purposes, rather than a minimum flow. The environmental agency responsible for the impoundment would be able to manipulate its share of the water independently of the water management agency. Stephen Swales responded that NSW Water Resources (DWR) was examining environmental contingency allowances within its storages. Hugh Cross added that DWR has a three component environmental flow policy including an operations component where water is released from dams for irrigation, an environmental contingency component which can act as a flush or piggyback release on tributary flows, and an unregulated flow component. This system has to be flexible because dams are small and have an insignificant effect on flood flows for instance, whereas others hardly ever fill because the dam is too big for the catchment.

Murray MacDonald repeated his earlier concern about using habitat enhancement and restoration as means of legitimising continuing disturbances of habitats. He asked Rick Morton if he believed that proposals to re-create habitats were actually going to come anywhere near compensating for the loss in productivity since the beginning of significant European impact, and if not, how can we claim that enhancement and restoration is actually looking after habitats *in toto* and not just a piecemeal effort. Rick Morton apologised for not having data preceding European settlement, but reiterated that the Tweed River needs to be dredged to prevent the estuary clogging with sand. While dredging may not totally compensate for the sand intrusion, it was certainly a step in the right direction.

Barbara Richardson asked what follow up work would be undertaken in the Tweed River program, and other similar research programs. In this case, Rick Morton said it was up to the NSW Public Works Department to commission follow up work, however he suggested that if a developer is required to put in compensatory works, then there should also be an accompanying requirement to monitor them. As an example, a number of American states require developers to put in compensatory salt marshes, with successful compensation being determined by a minimum percentage of sprig success and regeneration.

Bob O'Boyle agreed that when developing a model, follow up work is essential to find out if that model really does reflect reality. He commented that the dredging of Halifax Harbour uncovered a Pandora's box of heavy metals and other leaching agents in the sediments and asked Rick Morton whether similar aspects were addressed in the Tweed estuary. Rick Morton indicated that there was very little silt associated with the clean oceanic sand that was entering the estuary, so turbidity plumes and related problems were unlikely to occur. However silt and pesticide analyses were undertaken as a precaution.

Derek Staples asked Ian Poiner if he remembered 15 years ago wearing T-shirts reading 'Muddies Need Mangroves', and then questioning whether mud crabs really needed mangroves at all? He then asked if mud crabs still needed mangroves and if so why? Ian Poiner strongly denied ever wearing those T-shirts for fear of offending Dr Hill, but believed that mud crabs don't really need mangrove systems. While agreeing with ecosystem approaches to coastal management, he thought a much more focused attitude should be taken to identify the key factors which sustain the fishing industry. He believed the issue ultimately comes down to questions of allocation between developers and fishermen, and didn't really think the fishing industry was in a strong position at this time to win many allocation battles.

Peter Young expressed concern about the religious zealotry that seemed to go around every time someone said 'habitat'. He also put forward the idea that the ecosystem must be modified to maximise the yield of fish.

Ian Poiner commented that fishery scientists still do not really understand the couplings between fish populations and shallow water coastal habitats. He said that it was illogical to manipulate a poorly-understood system and somehow 'twiddle' it to maximise a few populations that have value to the fishery, because that is a very risky strategy. Rob Lewis argued that fisheries agencies needed to integrate all the issues and considerations involved in traditional fisheries objectives to provide what society expects today.

Campbell Davies commented that recent work at James Cook University shows there is a tidal coupling between juvenile reef fish and seagrass and mangrove areas. Ian Poiner reflected that there is no doubt that mangroves and seagrass are important to fisheries, but he would be very surprised to find that all seagrasses are important to those juvenile fish. Rick Morton further remarked that not every mangrove is important, as some mangroves growing in areas that are barely touched by the tides couldn't

possibly have the same ecological value as mangroves that have the tide coming in twice a day with fish feeding amongst them. Jenny Burchmore expressed her concern that this was a really dangerous area to get into from a management perspective, because unless each mangrove stand and seagrass bed in each State is investigated to determine its ecological function, these areas need blanket protection to protect the vitally important areas that we do not yet understand. To indicate that some of these areas were less important than others was a very dangerous game to play.

Ian Poiner continued the debate by saying he would like to see those activities impacting seagrass systems, such as the northern prawn fishery, stopped, but couldn't see it happening in the foreseeable future because of the question of resource allocation. Rick Morton agreed and, using a mining project as an example, said that the federal government had decided that the benefits of mining to the Australian community outweighed the loss of an area of wetland. The pragmatic question was then to minimise the impact of mining on wetlands.

Jeremy Prince questioned what people were actually fighting to maintain. He explained that in British Columbia, an abalone fishery was recently closed down to protect declining stocks as a conservation issue. The interesting thing was that the abalone fishery was only a recent development since sea otters, which kept abalone populations in check, had been virtually hunted to extinction in the area before the turn of the century. Thus the modern abalone fishery was exploiting a resource which came into being because sea otters were no longer there. Now the abalone fishery has been closed down on conservation grounds, and the sea otters are coming back, abalone stocks appear to be reverting to historical background levels. Jeremy Prince's point was that whatever we try to sustain, we need to be very clear on whether we want to preserve a pristine environment, or maintain a productive environment for human ends?