

## **GENERAL DISCUSSION**

<b>Session Chairperson:</b>	P.C. Young
<b>Session Panellists:</b>	R.K. Lewis
	R.K. Gehrke
	B.E. Pierce
	C.M. Macdonald
	R. Reichelt
	B.A. Richardson
<b>Rapporteur:</b>	P.R. Last

# GENERAL DISCUSSION

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**Recorded by P.R. Last**

*CSIRO Division of Fisheries*

*GPO Box 1538*

*Hobart TAS 7001*

## **Chairperson's summary**

By way of a brief review of the proceedings of this Workshop over the past few days, I will take five minutes to identify a few of the critical issues that emerged as I saw them and then ask each of the Session Chairs to briefly review the issues for a few minutes. I will then seek to draw the Workshop together to attempt to synthesise a cogent view of the topic "Sustainable Fisheries through Sustaining Fish Habitat".

We started yesterday with an illuminating keynote address by Stan Moberly who clearly identified a number of critical issues in America. These broke down into the need:

- 1) for scientists to inform users and decision-makers of the value of habitat;
- 2) to develop better administrative arrangements for managing habitats that are impacted by cross-state or even cross-country activities; and
- 3) for scientists to have a key role in bringing the conflicting resource uses together for strategic planning.

Following Stan Moberly's address, we examined a manager's view of fish habitats. During this session the central theme that emerged was that there were competing uses of the ecosystem many of which will impact on habitats and fisheries.

The 4 pertinent issues became:

- 1) Who is going to control the use between conflicting users?
- 2) How do we minimise the effects of conflicting use on habitat?
- 3) The need to identify how these effects on habitat affect fisheries.
- 4) To do 1 – 3 we need to develop appropriate research and monitoring strategies to incorporate multiple use so that:
  - (a) decision-makers can develop planning strategies; and
  - (b) the data are there for scientific advice.

Turning to the relationship between organisms and environment, we were stimulated by the concept that although we really know very little about the functioning of habitats, we are making sweeping announcements of their value and, following that, have incorporated strategies to modify habitats by engineering and bioremediation. It became clear during the discussion that although we are modifying habitat to produce the "ideal climax", there appeared little agreement as to what was the "ideal climax" nor if we were sure about how to achieve it.

Turning to the organism/environmental relationships, we had some problems defining key factors to fishes. We were fairly sure about

freshwater where the notion of limited and critical factors was suggested to develop the concepts of ecophysiological controls and critical use of habitat. However, as we moved farther towards the marine area the precise role of critical habitat became clouded. We identified that habitat is important but don't yet have a really good definition of the importance. We then need to better define our goals. As scientists we want to know more, but as managers we need to be ready to summarise our present knowledge for guidelines.

We must determine what is the important scale for defining and protecting habitat, and although we don't know enough, we must produce a reductionist view. This will be enhanced by the role of the modeller who will help us to define what are the critical elements still unknown about the processes to sustain this minimum necessary knowledge.

Overall, by the end of the day we come back to the issue that we already know enough about some habitats to be at the stage where we must persuade people to understand what we know and to share the conclusions. This might be helped by linkages between professional societies such as the Institution of Engineers or by other initiatives such as a "Status of the Aquatic Habitats" report.

Day 2 started off with the impacts of human activities on habitat and fisheries and discovered that most of the things we summarise about the relationship of habitat and fisheries are based on inferences rather than experiments. We were treated to the results of a long term experience which did investigate these relationships. However, because of the cost in dollars and time, it was suggested that perhaps we should now take our best guesses and actively seek to insert them into the decision-making process.

We established that it was important to identify the activities which cause change that impacts on habitats critical to fish communities.

When looking at the alternative uses of habitat, we heard that we may need to set up

broad-based refugia from consumptive use, but that an alternative methodology would be to seek to develop the concept of value-adding to habitat use in its broadest sense. This again emphasised the importance of communication, institutional reform, and managing strategically for all users.

We then turned to this concept of management in terms of ameliorating effects, enhancing and conserving habitats.

We heard of the approach to conserving habitats by defining the habitats as functional units, using explanatory models to understand the ways that proposed activities may impact on them, and the need for appropriate regulation and data collecting limited to decision support systems. There may be some benefit in considering the purchase of "pollution rights".

Amelioration and enhancement of habitats is more difficult. We lack the knowledge of how to restore habitats, and at this stage are preparing experiments to work out how to do it. In view of this, what is the *real* compensation for habitat destruction? How are we going to develop the information required to improve habitats and ameliorate effects?

### Session Chairpersons' summaries

Andrew Staniford, deputising for Russell Reichelt, commenced with a summary of Session 6 which covered the alternative uses of aquatic habitats. Two proposals were put forward: a regulatory approach based on marine parks or marine development zones as a method of managing the marine ecosystem; and a value-added approach which tries to identify the extra value that can be achieved by changing the allocation of the resource between the competing users, as well as by changing their levels of activity. He stressed that the two approaches are closely linked. Together they form important tools in establishing priorities for strategic planning and determining which areas are important for certain activities. The main advantages of an

economic approach are in providing some sort of measurable, objective criteria for comparing uses, and assessing how changes in the way a resource is used will affect the community.

Murray MacDonald, in summarizing Session 5 on the impact of human activities on habitat and fisheries, felt that the discussion had focussed on two major issues. Firstly, with few exceptions (ie. in freshwater and the most accessible environments where the best information is available), evidence suggests that linkages are circumstantial rather than proven by cause and effect type evidence. Secondly, the role of scientists in getting the message across regarding the importance of habitats needs to change. The traditional role of scientists, in conducting research and monitoring type studies to provide detailed information and expert advice on habitat conservation and management, is still a legitimate and very important role but we have to broaden our view of our roles and start thinking of ourselves also as purveyors of information in a much more simplified form.

Bryan Pierce then provided his perspective on Session 4 which dealt with the key variables and broad-based issues that affect organisms and environmental relationships. He concluded that habitats were only unimportant in the deepwater/pelagic zone, and that inshore the priorities diminish progressively from inland through to coastal habitats. A model of the adaptive management process using the key factors was seen to be a "n-dimensional headache" because we cannot even determine general key factors. An educational role was also identified as being critically important.

Peter Gehrke summarized the results of Session 3 covering case studies of organisms and environmental relationships, during which a number of the processes for sustaining fish habitat were addressed. While he had originally believed that our knowledge of fish habitat was in some way proportional to the number of people researching each of the various habitats (ie. that estuarine and coastal systems had been worked to death while freshwater habitats were

less well understood), he felt that this viewpoint had been reversed during this workshop. Debate focussed on the need to supply information quickly to address the present need for habitat amelioration, as against the more traditional research response which was seen as causing only more delays before providing "answers". Gaps between managers and researchers need to be filled to provide some urgency of response to habitat issues.

A triage response to avoid time-wasting was proposed with a line of ascending priority from habitats that don't need any real sustenance other than protection, through those that need some form of active sustenance, to those that require totally rebuilding. Model driven research, which feeds the best available information to managers but also highlights the knowledge gaps for researchers, was preferred to piecemeal and fragmentary data fed intermittently to managers.

Peter Gehrke believed that this last approach had led to potential problems in Australia because of a tendency to concentrate on system ecology or ecological questions without, in many cases, evaluating details of the processes driving the systems. "By ignoring some of the finer points of how the processes work we run the risk of trying to run before we can crawl when it comes to managing habitats - we end up getting lost in trying to repair and maintain their virginity". A coordinated modelling effort must be established to provide some form of expert system that can advise managers and at the same time refine the hypotheses needed to direct research. He concluded by raising the issue of the effects of global climate change on fish habitat.

A manager's view of fish habitat (Session 2) was then summarized by Rob Lewis. He believed that the consensus view is that we want to see the habitat managed successfully and we all want to contribute to that outcome. Session 2 had identified a need to address the issues, such as competing use, impacts and demands, which cannot be handled solely by fisheries interests.

A key role for ASFB was also identified despite differing views on specific issues within the membership. This group, with the expertise and the will, was considered to be capable of taking a lead (ie. harnessing, coordinating, and promoting these actions). There is a need to coordinate the scientific component, communication, and the planning and application stages with appropriate strategies at different levels for different audiences. Finally, he observed a widespread emotional commitment to prevent further habitat decline or at least replacement, and to look beyond maintenance alone and consider habitat amelioration.

Before Barbara Richardson's summary of Session 7 on the amelioration, enhancement and conservation issues of management, Peter Young suggested the need for focussing the subsequent discussion and invited Barbara Richardson to present additional overheads considering the focal issues.

Barbara Richardson commenced by pointing out that much of our effort is directed towards firefighting, largely unproductive, and needs to be focussed on a strategic planning process. She acknowledged that the Society had the resources and the commitment and proposed a more structured visionary approach to be outlined in the workshop proceedings. Within the planning process, she felt that we need a clear definition of goals, to consider all the possible strategies available, to develop performance indicators, and most importantly to "look at where we are going and see if we are actually getting there".

She believed that the strategies identified during the workshop had merit, highlighting the entrepreneurial experiences of some participants. As an example of integration, she referred to Bob O'Boyle's experiences in Canada. She proposed an adaptive management strategy and drew attention to several other issues discussed: identification and consideration of problems; the inadequacy of some existing legislation; the possible inadequacy of our information base and future data needs; and the importance of

modelling as a strategy for focusing on our information needs, setting of research priorities, and in the design of monitoring programs. She referred to a problem identified by Jenny Burchmore relating to our influence in the decision-making process, and felt that many stakeholders affect these decisions and the Society needs to play a more active role.

A list of the major issues identified by an informal working group the evening before was shown (Tables 1 and 2). Barbara Richardson pointed out that the list was largely unstructured but contained many issues for general consideration. She reiterated the sentiments of other participants that although many of the habitat issues have been discussed for 20 years we haven't achieved much to date. She felt that a current situation statement outlining the issues, and our views concerning possible action plans, should be included in the proceedings. This statement should also highlight the importance of fish habitat management. She outlined some focal questions that might be considered during the drafting process: whether there should be more integration between traditional fisheries management and other ecosystem users; the need for more research and the identification of issues considering data requirements; extracting from managers around the country their perspective of key issues and pressures; and the need to focus scientists' priorities for research and management.

She suggested producing a synthesis of these viewpoints but acknowledged that doing so might not be realistic within the time remaining. The issue was left open for the chairperson to decide but she felt that an outline of current key issues could be used as a yardstick in the future. This would also highlight the next step, particularly if drafted as a situation and action statement, which she suggested might need to be constructed by a drafting committee.

Other important issues included the desirability of having a "state of fish habitats" assessment document with annual upgrades. This document, possibly enlisting broader

community help, would complement impending State legislation on environmental reporting. She recommended the formation of an ASFB sub-committee to meet annually with the responsibility of implementing workshop outcomes and reviewing the progress of fish habitat management. She proposed the establishment of an annual newsletter covering fish habitat issues and forming closer links between ASFB and government agencies. She felt the Society could take a leading communication role by convening a national workshop including representatives from all groups whose activities impact on fisheries resources together with conservation groups and government agencies. Society members could also create an awareness of fish habitat by publishing in popular scientific journals such as "Geo" and "Search". A news release could be produced from this workshop drawing attention to the major issues identified.

Peter Young, however, cautioned that it is easy to set work up but it is sometimes harder to find someone to do it. He also pointed out that fisheries managers are now recognising the importance of habitat and suggested that ANZFAC (formerly Standing Committee on Fisheries) may form a committee to monitor habitat in the near future. He then opened the session for question time and invited the president, Julian Pepperell, to suggest where we could progress after the discussion.

## Discussion

Don Hancock was concerned about the general viewpoint that "not much had been done". He felt that a great deal had been done but probably not quickly enough. A great deal of work was being done independently by individual States but there seems to be no national forum for the discussion of technical issues, and most environmental committees are forced to work to administrative guidelines. As an example, he referred to his experiences as a member of the Fisheries Pollution Committee (FPC) of the

then Standing Committee on Fisheries. He suggested that the Society should investigate the activities of and provide input into such committees. He challenged the perception that there was little scientific communication with the fishing industry or the general public. He believed that communication ranged from quite good to exceptional and that we should be encouraged with our efforts rather than discouraged. He advocated greater communication between the States and referred to the example cited earlier by Jenny Burchmore of the oil pollution atlas.

Peter Young commented that the FPC and affiliates do consider national issues and the CSIRO's Division of Fisheries provides the secretariat for that committee.

Ross Winstanley supported this view, stating that whereas the FPC addressed a narrow field of issues 15 years ago, the committee now displayed a changing emphasis, focusing more on the habitat and environmental aspects of fisheries management. He commented on Peter Young's prediction that ANZFAC may establish a sub-committee to investigate fish habitat issues in relation to fisheries by stating that it was long overdue.

Duncan Leadbitter reiterated the point about the type of information needed and the need to approach the relevant groups for input. In his capacity as a member of NFIC's environment committee, he claimed that an informal approach from ASFB to collaborate on habitat issues would be welcomed. He also offered to coordinate a small working group to draft guidelines for environmental impact assessments.

Peter Young then raised the issue of an inventory of critical habitat. Very good examples of this kind of data have been collected in the USA and some other countries. He sought the views of the meeting and raised a number of related questions: should an inventory be constructed; if so, on a national or State by State basis; what information is available and is it archival; should we approach Environmental

Resources Information Network (ERIN) or National Resources Information Centre (NRIC) to get it onto a Geographical Information System (GIS)?

Murray MacDonald felt that the Society ought to be taking a higher profile in bringing these issues before the general public, as well as the legislators and managers. He suggested that part of the costs of convening a conference and making statements about the state of the marine environment could be met externally by dovetailing the Society's interest with current national initiatives. Two such initiatives are the development of a national "state of the marine environment" report process and the development of a national conservation strategy. The "Ocean Rescue 2000" scheme was suggested as a possible funding source and co-convenor of a conference to discuss these issues.

Roland Pitcher proposed an alternative cost-effective communication method involving the ABC's "Survival" program. He outlined possible contents of episodes and suggested that the ASFB president contact the producers of "Survival" to canvas the issue.

Stewart Frusher, giving the example of his own work on rock lobster, expressed concern at not being able to view changes to habitat beyond diving depths (ie deeper than 30 m). He alluded to the high cost factor of studying habitat at greater depths. His sentiments were shared by Peter Young.

David Smith strongly supported the need to prepare a current situation report together with a separate document on the state of fish habitat. He felt that these issues should be handled by a resurrected habitat sub-committee because the Workshop forum was too large and unwieldy. Peter Young supported these views referring to the highly respected Endangered Fish sub-committee which is the major source of advice in this area to the regulators of relevant fisheries. He stressed that the influence of ASFB shouldn't be underestimated.

Norm Hall, readdressing the issue of an inventory, stated that to convince decision-makers you need performance measures to gauge the effectiveness of habitat protection strategies. He commented that most bureaucracies set up committees when a problem arises whereas researchers traditionally collect more data to study the problem. Now, both groups see the need to develop models of these systems to help identify suitable management options. As a consequence, the various bodies responsible for managing aquatic habitats will require more integrated types of studies with a focus on modelling the underlying process. Such a focus will certainly help bring the data together. However, he cautioned that the modelling exercise is not a panacea and does have serious limitations in the present climate where data sets are incomplete. He also alluded to problems of communication and bringing regulatory bodies together.

Peter Young took up this point and raised the issue of integrating catch and management, the effectiveness of which is entirely dependent on the good will of the various regulatory bodies involved. In these instances, the modelling approach acts "as a facilitator to get pig-headed people to become less pig-headed".

Dianne Hughes commented on the size of goals suggested, intimating that they were probably overambitious. She felt, referring to issues raised by Barbara Richardson, that it might be more sensible to set smaller, more achievable goals.

John Koehn agreed with most of the ideas that Barbara Richardson had put forward and believed that the workshop should take Stan Moberly's advice and be pro-active. ASFB, being immune from some of the problems confronting us within our various agencies, could become Australia's leading voice. He stated that workshops should have a bottom line, setting out priority needs and areas. While uncertain about its worth for marine habitats, he believed it possible for freshwater and wished to see action taken at this workshop.

Martine Kenlock followed up the suggestion by Roland Pitcher by offering to contact the producer of "Survival" on behalf of the Society.

Peter Young conceded that it was impossible to progress further given the size of the forum and invited Julian Pepperell, as president of ASFB, to give his perspective on where the Society should go from here.

### President's summary

Julian Pepperell agreed with the panellists' view of the Society's role and endorsed most of their ideas, stressing the need to be independent. He addressed the issue of conflicting interests, which sometimes occurs between the Society and the Institutional roles of members, but quoted Stan Moberly's experiences with the American Fisheries Society which has been very successful in providing an independent voice in the USA. He strongly endorsed re-establishment of the habitat sub-committee and invited Barbara Richardson, as the newly appointed chairperson, to appoint additional members. He agreed with most, if not all, of the action plan provided by Barbara Richardson in Tables 1 and 2 and suggested that a copy should be made available to members at this workshop. He felt that the Society had the expertise to provide information on a national scale with members needing to think more broadly beyond their own regional boundaries. The approaches of the National Marine Fisheries Service and the American Fisheries Society, in producing a document on the state of aquatic habitats, were used as role models. He suggested coordinating with other similar interest groups, such as "Ocean Watch 2000", but without compromising the Society's position. The Society's major goal should be to assess the plight of habitat over the *past* 200 years of European settlement in order to warn decision-makers of possible dangers in the *next* 200 years. He stated that ASFB should be in an ideal position to provide advice on key issues to any related sub-committee established by ANZFAC.

The role of this new sub-committee would be similar to that of the Endangered Fish Sub-committee which has an extremely important advisory role.

Peter Young then closed the session and asked Stan Moberly to deliver his summary.

### Table 1. Habitat management

- Present situation—Analysis
- What do we need to achieve?
  - By – Amelioration → site/system specific
  - Enhancement → site specific
  - Conservation → package of measures to apply to all waters
- How will we know if it's working?
- Data needs
- How can we improve the protection and management of fish habitat?

### Table 2. Improving fish habitat protection and management

- Agency profile and effectiveness
- Researchers and managers promote awareness and information
- Collaborative programs with other government agencies or disciplines
- Community programs—involvement
- Media
- ASFB