National Symposium on Ecosystem Research and the Management of Fish and Fisheries – an ASFB Workshop

T.M. Ward, S. Mayfield & M.C. Geddes

Final Report to the Fisheries Research and Development Corporation

FRDC Project 2004/303

February 2007

SARDI Aquatic Sciences Publication No: RD04/0086

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Australian Government

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Fish for the future

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Department of Primary Industries

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NON-TECHNICAL SUMMARY

2004/303 National Symposium on Ecosystem Research and the Management of Fish and Fisheries – an ASFB Workshop

PRINCIPAL INVESTIGATOR: Dr T.M. Ward

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OBJECTIVES:

1. To conduct the ASFB 2004 workshop as the 'National Symposium on Ecosystem Research and the Management of Fish and Fisheries'.

2. To involve international and Australian experts on: pelagic fisheries and trophodynamics; temperate reef fisheries and benthic communities; and rivers and estuaries with limited and variable flows.

3. To publish the proceedings from the Symposium in a peer-reviewed, high-quality format.

NON-TECHNICAL SUMMARY:

OUTCOMES ACHIEVED

The most important outcome of 33rd annual Symposium and Conference of the Australian Society for Fish Biology was the opportunity that it provided for fishers, resource managers and scientists to discuss and indentify the practical implications and scientific ramifications of the increased pressures to assess and manage the ecosystem effects of fishing. The focus on themes invoving pelagic, benthic and inland fisheries and ecosystems ensured that the papers and discussions had practical relevance for all jurisdictions. Research projects currently underway on the ecosystem effects of the SA sardine fishery, the Tasmanian rock lobster and abalone fisheries and the current flow reduction in the Murray River system have explicitly benefited from relationships and discussions that were developed at the Symposium. The National Symposium on Ecosystem Research and the Management of Fish and Fisheries was an important step towards ensuring the ecogically sustainable utilization of Australia's fisheries resources and aquatic ecosystems.

For more than 20 years, FRDC and the State, Territory and Commonwealth fishery agencies have provided ongoing support for the Australian Society for Fish Biology (ASFB) that has enabled it to host an annual, national workshop.

The 33rd annual Symposium and Conference for the Australian Society for Fish Biology was held in Adelaide, South Australia, in September 2004. The symposium – National Symposium on Ecosystem Research and the Management of Fish and

Fisheries – provided a forum for stakeholders in the Australian fishing industry and the nation's leading fisheries scientists and managers, to identify and discuss options (and constraints) for addressing the increased legislative and social pressures to assess and manage the ecosystem effects of fishing.

This topic was well received, as agencies throughout Australia are currently working towards addressing these issues. This ensured that the symposium and conference were an outstanding success in several respects. The symposium and conference were attended by more than 170 and 200 delegates, respectively, from throughout Australia. There were also six internationally renowned scientists, representing Canada (Professors Reg Watson and William Montevecchi), South Africa (Professor George Branch and Dr Alan Whitfield) and the USA (Professors Mark Butler and Don Jackson). Thus, the 2004 Symposium on Ecosystem Research and the Management of Fisheries continued the Australian Society for Fish Biology's strong series of national workshops on key issues in fisheries science and management.

Background to the discussions was provided by presentations from members of key stakeholder groups, as well as representatives from Commonwealth and State Government agencies that are responsible for ensuring that fisheries are managed according to the principles of Ecologically Sustainable Development. This was followed with presentations from renowned international scientists outlining their experiences in conducting ecosystem-based research in each of the three broad sub-themes for the workshop: (1) interactions of pelagic fisheries and marine ecosystems; (2) roles of fisheries species in structuring benthic ecosystems; and (3) managing fish and fisheries in rivers and estuaries with limited and variable flows.

The three sub-theme workshops then provided the scope for leading scientists from research agencies throughout Australia to describe the current status of ecosystem-based research and management within their areas of expertise. Thereafter, delegates identified key management needs and research questions, considered options and approaches to ecosystem research and discussed national strategies and approaches. The outcomes from these workshops, as well as short summaries of each of the presentations from both plenary and concurrent sessions, are documented in the Symposium proceedings.

The citation for the proceedings is:

Ward, T.M., Geddes, M.C. & Mayfield, S. (Eds). 2006. National Symposium on Ecosystem Research and the Management of Fish and Fisheries. Australian Society for Fish Biology Symposium Proceedings, Adelaide, South Australia, September 2004. 156pp.

KEYWORDS: ASFB, ecosystem research, fisheries management

FINAL REPORT

2004/303	**National Symposium on Ecosystem Research and the Management of Fish and Fisheries – an ASFB Workshop**

Background

The Australian Society for Fish Biology (ASFB) is the professional society for fish and fisheries research in Australia. Each year, ASFB hosts a workshop on a topical issue in Australian fisheries.

The workshop for 2004, held in Adelaide, South Australia, was entitled 'National Symposium on Ecosystem Research and the Management of Fish and Fisheries'.

Three themes were addressed during the workshop. These were:

1. Interactions of pelagic fisheries and marine ecosystems;
2. Roles of fisheries species in structuring benthic ecosystems; and
3. Managing fish and fisheries in rivers and estuaries with limited and variable flows.

International experts within each of the three themes were invited to address the Symposium, both in plenary and concurrent sessions, and to facilitate discussions on each topic. Similar invitations were extended to leading Australian fish and fisheries researchers and managers.

The proceedings from the Symposium have been published (Ward *et al.* 2006), and selected manuscripts were published in a special issue of *Aquatic Living Resources* (2005, Volume 18, Number 3).

This Symposium continued the high quality workshops that have been conducted by ASFB since 1969. It engendered significant support from around Australia.

In conjunction with FRDC and SARDI, numerous State and Commonwealth Government Agencies provided sponsorship.

Need

There are increasing national and international pressures to manage fisheries according to the principals of Ecologically Sustainable Development (ESD, e.g. Convention on Biological Diversity 1992; National Strategy for Ecologically Sustainable Development 1992; Australia's Ocean's Policy 1998).

Implementing ESD for Australia's fisheries means that research and management will need to focus increasingly on ecosystem effects. Recent assessments have shown that few data are available on the ecological effects of most fisheries.

These concepts and approaches are in the developmental stages and need to be better defined, applied and communicated.

Objectives

1. To conduct the ASFB 2004 workshop as the 'National Symposium on Ecosystem Research and the Management of Fish and Fisheries'.

2. To involve international and Australian experts on: pelagic fisheries and trophodynamics; temperate reef fisheries and benthic communities; and rivers and estuaries with limited and variable flows.

3. To publish the proceedings of the Symposium as a peer-reviewed, high-quality document and publish key presentations together as papers in the primary scientific literature.

Methods

The 2004 ASFB workshop was held in Adelaide, South Australia. In keeping with previous formats, the workshop was held on Monday 21 and Tuesday 22 September, with the Annual Conference held on Thursday 24 and Friday 25 September. Wednesday 23 September was retained as a lay day.

The 2-day workshop began with presentations from a broad range of stakeholders that provided a context for the discussions, and perspectives from three, internationally renowned scientists that each provided a keynote address (see Appendices 3 and 4).

The workshop then addressed three key issues in each of the three concurrent themes. The key issues addressed were (1) the identification of key management needs and research questions; (2) to consider options and approaches to ecosystem research; and (3) to discuss national strategies and approaches.

As in previous workshops, panelists covered a wide range of topics within each theme. Considerable time was provided for general discussions that were recorded.

The workshop was concluded with presentations from the facilitatiors of each of the three themes. Summaries of all presentations provided and the subsequent discussions are documented in the proceedings from the workshop.

Results and Discussion

The Symposium was an outstanding success, being attended by more than 170 delegates from throughout Australia, with representation fom all State and Commonwealth Agencies involved in the management of fish and fisheries. There were also six internationally renowned scientists, representing Canada, South Africa and the USA. This broad spectrum of participants ensured wide-ranging discussions across a variety of issues relevant to progressing the move towards Ecosystem Based Fisheries Management (EBFM). The diversity of these discussions and the differences among the three sub-themes were one of the highlights of the event.

There were, however, numerous similarities in the discussions and summaries of each theme. For example, there was general acknowledgement that this is a

challenging undertaking, and one that would be greatly assisted by fishery and ecosystem managers developing clear, measurable and agreed objectives for EBFM. There was also consensus that the threats that will be addressed via EBFM, as opposed to more 'traditional' single-species approaches, need to be identified. However, depending on the expected role of a species in the ecosystem and the extent to which it is exploited, the need to retain TFM principles (e.g. the use of single-species stock assessments) as a basis for an EBFM approach was highlighted. There was also agreement that 'gap analyses' should precede focused research, that economic and social implications must be considered, and that funding realities cannot be ignored (i.e. requirement to balance idealism with realism).

Participants across the three themes also agreed on the crucial role of long-term monitoring, coupled with increased community education and stakeholder collaborations, particularly in developing predictive capabilities. There was also agreement on the need to engender a 'whole of system' perspective and for enhanced communication across the broad range of disciplines that comprise the scientific spectrum.

The diversity of views about EBFM and the generally broad, rather than specific, outcomes from the workshop indicate that the ecosystem symposium was timely for the Australian fisheries community. EBFM is beyond its infancy, but is still far from being a mainstream feature of fisheries management in Australia: this will take time, much work, and must be preceeded by a clear understanding of what is being attempted and why. An underlying reason for holding a symposium on this topic was to provide a forum for discussion of the EBFM concept within an Australian context. The educational benefits of the workshop, such as clarification of what EBFM means to different groups within the fisheries community (researchers, managers, sectoral representatives), gained through both the wide-ranging discussions and the focused interactions are a significant achievement beyond what can be provided in these proceedings. The crucial exchanges of information facilitated by the workshop may not produce direct "government level" outcomes, but will result in tangible improvements in the way EBFM evolves in the various jurisdictions around Australia responsible for managing (or co-managing) aquatic resources.

The workshop proceedings contain 'extended abstracts' of the papers given by each of the panelists. 'Extended abstracts' were received from all but seven panelists. A record of the discussions within each of the three themes is also provided in the proceedings.

The citation for the proceedings is:

Ward, T.M., Geddes, M.C. & Mayfield, S. (Eds). 2006. National Symposium on Ecosystem Research and the Management of Fish and Fisheries. Australian Society for Fish Biology Symposium Proceedings, Adelaide, South Australia, September 2004. 156pp.

Four papers were published in *Aquatic Living Resources* (2005, Volume 18:3).

Benefits and Adoption

Research projects on the ecosystem effects of the SA sardine fishery and the Tasmanian rock lobster and abalone fisheries and the effects of reduced flows on the fish communities of the Murray River that were discussed and developed at the Symposium will provide the basis for establishing ecologically performance indicators for some of Australia's most important fisheries and for ensuring the conservation of management of south-eastern Australia's unique inland fish assemblages.

Further Development

Future workshops and seminars will build on the ideas and relationships developed during the Symposium, and will contribute further to the ecologically sustainable utilization of Australia's fisheries resources and aquatic ecosystems.

Planned Outcomes

By achieving its primary outcome of facilitating discourse among fishers, resource managers and scientists on ecosystem management challenges with practical relevance for all jurisdictions the Symposium achieved its goal of assisting the development of systems to ensure the ecologically sustainable utilization of Australia's fisheries resources and aquatic ecosystems.

Conclusions

The symposium and conference were an outstanding success, being attended by more than 170 and 200 Australian delegates, respectively, and involving six internationally renowned scientists from Canada, South Africa and the USA.

The 2004 Symposium on Ecosystem Research and the Management of Fisheries continued the Australian Society for Fish Biology's important series of annual workshops on key issues for Australia's fish and fisheries.

Importantly, the Symposium provided a forum for stakeholders in the Australian fishing industry and the nation's leading fisheries scientists and managers to identify and discuss options (and constraints) for addressing the increasing legislative and social pressures to assess and manage the ecosystem effects of fishing.

The high level of involvement of resource managers and policy makers, including sponsorship from the Natural Heritgae Trust and Murray Darling Basin Commission, and the scene-setting presentation by Ms Tori Wilkinson from the Commonwealth Department of Environment and Heritage were highlights.

The capitivating, and somewhat conflicting, presentations by Dr Leanne Fernades of the Great Barrier Reef Marine Park Authority and Mr Ted Loveday of Seafood Services Australia emphasized the complexities that are inherent to obtaining the optimal balance of ecological, economic and social outcomes in the face of the knowledge gaps, scientific uncertainty and contrasting political imperatives.

The presentations from the international scientists were also enlightening and emphasized Australia's outstanding success in addressing the complexities of the ecosystem-based managment of fisheries.

Acknowledgements

The major sponsors for the workshop were the South Australian Research and Development Institute, the Fisheries Research and Development Corporation, the Natural Heritage Trust and the Murray-Darling Basin Commission. Substantial contributions were also received from the NSW Department of Primary Industries, the WA Department of Fisheries, the Department of Primary Industries, Victoria, the Queensland Department of Primary Industries and Fisheries, the Tasmanian Department of Primary Industries, Water and Environment, the FRDC-ESD Subprogram and the Australian Fisheries Management Authority.

The members of the local organising committee were Mr Roger Edwards (South Australian Rock Lobster Fisherman's Association), Mr Travis Eldson (University of Adelaide), Dr Tony Fowler (SARDI Aquatic Sciences), Dr Dan Gaughan (ASFB President), Dr Simon Goldsworthy (SARDI Aquatic Sciences), Mr Neil MacDonald (South Australian Fishing Industry Council), Mr Bryan McDonald (SA Department for Environment and Heritage), Ms Merilyn Nobes (PIRSA Fisheries), Dr Jian Qin (Flinders University), Mr Ben Smith (University of Adelaide) and Mr Trevor Watts (South Australian Recreational Fisherman's Advisory Council).

Dr Scoresby Shepherd (SARDI Aquatic Sciences), Mr Crispian Ashby (FRDC), Dr Dan Gaughan (WA Department of Fisheries), Dr Gary Jackson (WA Department of Fisheries) and Dr Marcel Green (NSW Department of Primary Industries) assisted in reviewing and editing the proceedings. The text editor was Mr Ian Carlson (SARDI Aquatic Sciences).

Appendix 1: Intellectual property

No intellectual property has arisen from this project that is likely to lead to significant commercial benefits, patents or licences. The intellectual property associated with information produced from the project is shared between FRDC and ASFB.

Appendix 2: Staff

Dr Tim Ward	SARDI	Principal Investigator
Dr Mike Geddes	SARDI & Adelaide University	Co-investigator
Dr Stephen Mayfield	SARDI	Co-investigator

Appendix 3

Keynote Speakers

Pelagic:

Professor William Montevecchi

Memorial University of Newfoundland, Canada

Bill obtained his PhD from Rutgers University, and is on the faculty of the Department of Psychology, Memorial University of Newfoundland. Bill's research is focussed on the feeding ecology, energetics and trophic relationships of seabirds, and on the habitat relationships of landbirds. He conducts research on birds as consumers and bio-indicators in marine and terrestrial ecosystems. The primary emphasis of his work is conservation biology and multispecies interactions in low arctic and boreal ecosystems.

Professor Reg Watson

University of British Columbia, Canada

Reg is from the University of Queensland and is currently a Senior Research Fellow at the Fisheries Centre, University of British Columbia. Reg has 28 years of international experience and has expertise in a range of fisheries areas including penaeid biology, trawl fisheries, computer modeling, stock assessment and underwater visual census. He has published extensively on the simulation and optimization of trawl fisheries, and on bias in underwater visual census. An experienced ecological modeler, he was a principal researcher in a study of the impacts of marine protected areas and artificial reefs in Hong Kong. He led a team which developed national marine biodiversity policy for Indonesia. Reg is currently involved with the 'Sea Around Us' project.

Benthic:

Professor Mark Butler

Old Dominion University, Virginia USA

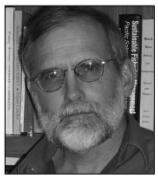
Mark completed a PhD at Florida State University and is currently a Professor and Assistant Chairman in the Department of Biological Sciences at the Old Dominion University, located in Norfolk, Virginia. His broad scientific interests are focussed around lobsters. Current research interests include evaluation of interactions between octopus and lobster, benthic processes in lobster ecology and the roles of physical refugia

Professor George Branch

University of Cape Town, South Africa

George completed his PhD at the University of Cape Town, at which he is currently a Professor in the Department of Zoology. He has primary interests in two different types of research. The first revolves around the ecology and management of intertidal and shallow subtidal rocky shores. The second is the management of marine fisheries, particularly the role of Marine Protected Areas, and the control of inshore stocks and particularly ecosystem approaches to fisheries management. Together with his students, this work has concentrated on rock lobsters, abalone, urchins, mussels and seaweeds.

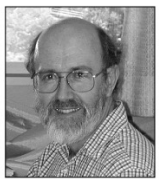
Rivers & Estuaries:



Professor Don Jackson

Mississippi State University, Mississippi USA

Don completed an MSc at the University of Arkansas and a PhD at Auburn University before joining the staff at Mississippi State University in 1986. His primary focus is river fisheries research, management and development. He has worked on international fisheries projects in South East Asia, Latin America, the Caribbean and Europe and is a Fellow of the American Institute of Fisheries Research Biologists.



Dr Alan Whitfield

South African Institute of Aquatic Biodiversity

Alan completed a PhD at the University of Natal and has worked at Natal University, Rhodes University and now at the South African Institute for Aquatic Biodiversity. His scientific interests are the importance of estuaries in the life cycles of fish species and on the impacts of development and environmental change on fish communities. His current research includes influences of river flow and ichthyofaunal change and the influence of estuarine type on the structuring of fish assemblages. He has written key international reviews in these areas.

Appendix 4

National Symposium on Ecosystem Research and Management of Fisheries

MONDAY 20 September

Morning: Plenary Sessions (for all three themes)

Session 1: Official Opening

Time	Presentation
8:00am	Registration
8:45am	Welcome: Tim Ward, Symposium Convener
8.50am	Hon Dr Sharman Stone MP, Parliamentary Secretary to the Federal Minister for Environment and Heritage

Session 2: Setting the scene

Time	Speaker	Presentation
9:05am	Tori Wilkinson	Ecological Assessment of Fisheries – Creation, Evolution, Revolution
9:20am	Rick Fletcher	Frameworks for assessing the management of marine resources – how do they all fit together?
9:35am	Leanne Fernandes	Biodiversity protection in the Great Barrier Reef Marine Park
9.50am	Ted Loveday	The Commercial Fishing Industry and Ecological Sustainable Development
10:05am	David Hall	ESD implications for the recreational fishing sector
10:20am	*Morning Tea*	
10:50am	Dan Gaughan	Goals of the Symposium from ASFB perspective

Session 3: International perspective - Keynote addresses from international speakers

Time	Speaker	Presentation
10.55am	William Montevecchi	Influences of Forage Species on Pelagic Food Webs: Signs from Seabirds
11:25am	Mark Butler	Benthic Fisheries Ecology in a Changing Environment: Unraveling Process to Achieve Prediction
11:55am	Don Jackson	Ecosystem Connections to River and Estuarine Fisheries
12:30pm	*Lunch*	

Session 4: Concurrent Sessions

Pelagic		Benthic		Rivers & Estuaries	
Time	Speaker & Presentation	Time	Speaker & Presentation	Time	Speaker & Presentation
1:30pm	**Co-ordinators** - Introduction	1:30pm	**Co-ordinators** - Introduction	1:30pm	**Co-ordinators** - Introduction
1:35pm	**Reg Watson** - Mapping global fisheries indicators and potential conflicts	1:40pm	**George Branch** - Biological interactions among rock lobsters, urchins, abalone and kelp: implications for ecosystem management	1:40pm	**Alan Whitfield** - Fish & freshwater in estuaries in South Africa
2:05pm	**Bill Montevecchi** - Sea bird indicators of changing pelagic food webs	2:25pm	**Mark Butler** - The ecological consequences of catching the Big Ones	2:10pm	**Ian Halliday** - Estuarine fisheries and flow management in central Queensland.
2:35pm	**Simon Goldsworthy** - Ecosystem approaches to examining seal-fishery trophodynamics: a comparison of a single and multi-species fishery in Australia	2:55pm	**Russ Babcock** - Benthic community structure and variation in indirect effects of fishing in Australasian kelp forests	2:30pm	**Stephen Balcombe** - Trophic basis of fish assemblages in an Australian dryland river
3:05pm	**Tom Okey** - Fishery-predator competition and the effects of predator depletions indicated by trophic models that incorporate benthic-pelagic coupling			2.50pm	**Kim Smith** - Catchment processes and fishery production in south-west WA
				3:10pm	**Alison King** - Highs and lows of fish recruitment in floodplain rivers
3:35pm	*Afternoon Tea*	*3:30pm*	*Afternoon Tea*	*3.35pm*	*Afternoon Tea*
3:50pm	**Ashley Bunce** - Improving fisheries sustainability: using seabirds to manage marine resources	3:50pm	**Colin Buxton** - Drivers for ecosystem based fisheries management in Australia	3:55pm	**Jacqui Balston** - Seasonal climate variability of (*Lates calcarifers*) fisheries in the GBR
4:10pm	**Peter Gill** - Blue whales in the Bonney Upwelling	4:15pm	**Stewart Frusher** - Multi-layered approaches to evaluating impacts of lobster fishing	4:15pm	**Martin Mallen-Cooper** - Fish passage – from go to whoa needs flow to go
4:30pm	**Cathy Bulman** - Trophodynamic Models in the South East Fishery	4:35pm	**Greg Jenkins** - Ecosystem effects of abalone fishing in Victoria	4:35pm	**Bronwyn Gillanders** - Otoliths, flows & fish movement
4:50pm	**Barry Bruce** - Determining ecological effects of longline fishing off eastern Australia	4:55pm	**Rod Connolly** - In situ and ex situ trophic consequences of fishing	4:55pm	**Patrick Coutin** -Ecosystem-based management of black bream in the Gippsland Lakes
5:10pm	**Norm Hall** -Implications from a model of the marine ecosystem off south-western australian	5:15pm	**Sean Connell** - Australia's southern reefs: theory meets reality	5:15pm	**Keith Bishop** - Changing freshwater inflows to Australian estuaries
5:35pm	*Close*	*5:35pm*	*Close*	*5:35pm*	*Close*

Correct at time of printing, subject to change

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National Symposium on Ecosystem Research and Management of Fisheries

TUESDAY 21 September

Session 5: Case studies

Pelagic		Benthic		Rivers & Estuaries*	
Time	Speaker & Presentation	Time	Speaker & Presentation	Time	Speaker & Presentation
8:45am	**Chairs** - Overview of previous day	8:45am	**Theme coordinator** - Overview of previous day	8:45am	**Theme coordinator** - Overview of previous day
9:15am	**Chairs** - Introduce case studies	9:15am	**Theme coordinator** - Introduce case studies	8:55am	**Mark Lintermans** - Native Fish Strategy & Sustainable Rivers Audit
9:20am	**James Scandol** - Management issues	9:20am	**Craig Mundy** - Tasmanian abalone fishery	9:10am	**Mark Siebentritt** - Living Murray & MFAT
9:30am	**Sally Troy** - Pelagic bioregionalisation	9:30am	**Stewart Frusher** - Tasmanian rock-lobster fishery	9:25am	**Shaun Meredith** - Flow, wetlands & fish
9:40am	**Jeremy Lyle** - Commonwealth Small Pelagic Fishery	9:40am	**Stephen Mayfield** - South Australian abalone fishery	9:40am	**Martin Mallen-Cooper** - Murray fishways & flow
9.50am	**Dan Gaughan** - WA Pelagic fisheries	9:50am	**Adrian Linnane** - South Australian rock-lobster fishery	9:55am	**Mike Geddes/Qifeng Ye** - Flows, ecosystem & fish: the Murray Mouth/Coorong
10:00am	**Tim Ward** - SA Pilchard fishery	10:00am	**Lynda Bellchambers** - Western Australia rock-lobster fishery	10:10am	**John Koehn** - Fish biology, management & threats
10:10am	**Sam McClatchie** - SA Upwelling system	10:10am	**Craig Johnson** - Detecting indirect effects of fishing on the structure and dynamics of rocky reef communities		
10:20am	**Simon Goldsworthy** - GAB Ecosystem project				
10:30am	*Morning Tea*	*10:30am*	*Morning Tea*	*10:30am*	*Morning Tea*
11:00am	Identify key management needs and research questions. Consider options and approaches to pelagic ecosystem research.	11:00am	Identify key management needs and research questions. Consider options and approaches to benthic ecosystem research.	11:00am	Identify the role of flows in improving habitat quality, recruitment, productivity and linkages for fish in the River Murray. Consider the role of wetlands and non-flow factors in rehabilitation targeted at native fish. Summarise this knowledge by developing a conceptual ecological model for the relationships between fish and flow in the River Murray and Murray estuary.
12:30pm	*Lunch*	*12:30pm*	*Lunch*	*12:30pm*	*Lunch*
1:30pm	Discuss national strategies and approaches	1:30pm	Discuss national strategies and approaches	1:30pm	Develop conceptual model for fish ecology and develop research & management priorities
3:30pm	*Afternoon Tea*	*3:30pm*	*Afternoon Tea*	*3.30pm*	*Afternoon Tea*

Session 6: Closing (for all three themes)

Time	Presentation
4:00pm	Presentations from each theme & general discussion
5:00pm	Close

* Supported by CRC for Freshwater Ecology

Correct at time of printing, subject to change