

River Health Forum Dalby, Queensland

16 May 2001

Summary Report 101/2001

**Cooperative Research Centre for
Freshwater Ecology**

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The Cooperative Research Centre for Freshwater Ecology (CRCFE) is a national research centre specialising in river and wetland ecology. The CRC for Freshwater Ecology provides the ecological knowledge needed to help manage the rivers in a sustainable way. It was established in 1993 under the Australian Government's Cooperative Research Centre Program. In the CRC, university, government and industry partners work together to understand river systems.

The Cooperative Research Centre for Freshwater Ecology is a collaborative venture between:

- ACTEW Corporation
- CSIRO Land and Water
- Department of Land and Water Conservation, NSW
- Department Natural Resources and Mines, Queensland
- Department of Natural Resources and Environment, Victoria
- Environment ACT
- Environment Protection Authority, NSW
- Environment Protection Authority, Victoria
- Goulburn-Murray Rural Water Authority
- Griffith University
- La Trobe University
- Lower Murray Water
- Melbourne Water
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- Murray-Darling Basin Commission
- Sunraysia Rural Water Authority
- Sydney Catchment Authority
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Ph: 02 6201 5168
Fax: 02 6201 5038
Email: pa@lake.canberra.edu.au
<http://freshwater.canberra.edu.au>

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OVERVIEW

The CRC for Freshwater Ecology facilitated a community forum in Dalby, Queensland to discuss river health with a focus on the Condamine-Balonne catchment. One hundred and ten people attended the forum, including farmers, representatives of irrigation organisations, council members, government-employed natural resource managers, thirteen speakers, environmentalists and others. The forum was organised in response to strong community and government interest in the health and future management of the Condamine-Balonne River system.

The purpose of the forum was to present the latest scientific insights into how rivers work and how to assess river health in inland rivers, with particular examples drawn from the Condamine-Balonne. It is anticipated that the forum will inform the on-going debate between community stakeholder groups and government about water management in the Condamine-Balonne river valley.

The information in this publication was produced by the CRCFE Knowledge Exchange Program to provide a brief summary of the key points made by speakers at the Dalby River Health Forum and the results of a survey of the audience.

The contents of this publication do not necessarily represent the views of members of the Cooperative Research Centre for Freshwater Ecology. For further information on specific talks contact the speaker directly.

Prof Gary Jones	CRCFE/University of Canberra	gjones@lake.canberra.edu.au
Prof Sam Lake	CRCFE/Monash	sam.lake@sci.monash.edu.au
A/Prof Richard Norris	CRCFE/University of Canberra	norris@lake.canberra.edu.au
Bob Munn	Community Representative	
A/Prof Martin Thoms	CRCFE/University of Canberra	thoms@science.canberra.edu.au
Dr Margaret Brock	CRCFE/DLWC	mbrock@dlwc.nsw.gov.au
Linda Lee	Queensland EPA	LindaJ.Lee@env.qld.gov.au
Dr Satish Choy	CRCFE/Queensland NR&M	satish.choy@dnr.qld.gov.au
Dr Glen Wilson	CRCFE/Northern laboratory	glenn.wilson@dnr.qld.gov.au
Dr Lee Benson	SKM	lbenson@skm.com.au
Prof Stuart Bunn	CRCFE/Griffith University	s.bunn@mailbox.gu.edu.au
Jo Voller	Queensland NR&M	jo.Voller@dnr.qld.gov.au

For further information on the River Health Forum contact the CRCFE Knowledge Exchange Program, University of Canberra, Building 15, ACT, 2601. Email: gjones@lake.canberra.edu.au.

PROGRAM

The forum was divided into three sessions with approximately equal time allocated for audience participation and discussion.

River Health Forum - Dalby RSL

10.30 ***Introduction***

Prof Gary Jones

10.40 ***Session 1. How do rivers work, how do you know if your river is healthy, and how healthy do you want or need your river to be?***

Prof Sam Lake	How rivers work
A/Prof Richard Norris	How do you know if your river is healthy?
Bob Munn	River health & indigenous life: then and now
Open Forum	What do you want from a healthy river?

Panel discussion

12.15 ***Lunch***

1.00 ***Session 2. How healthy is the Condamine-Balonne System?***

A/Prof Martin Thoms	River health at the catchment scale
Dr Margaret Brock	Lower Condamine-Balonne wetlands
Linda Lee	Water quality
Dr Satish Choy	What macroinvertebrates tell us
Dr Glenn Wilson	Fish
Lee Benson	Ecological condition of the Lower Balonne

Panel discussion

Lee Benson Some monitoring realities

2.45 ***Afternoon tea***

3.15 ***Session 3. What are the guiding principles for local action in river management?***

Prof Stuart Bunn	Principles for ecological best practise
Jo Voller	Improving river health through on-ground actions

Panel discussion

4.15 ***Close***

SESSION 1 - HOW DO RIVERS WORK, HOW DO YOU KNOW IF YOUR RIVER IS HEALTHY, AND HOW HEALTHY DO YOU WANT OR NEED YOUR RIVER TO BE?

How do rivers work?

Speaker - Professor Sam Lake CRCFE

How rivers work (ecosystem processes) and the types of plants and animals present (community structure) change along the river – the headwaters are different from the lower reaches. Different types of reaches need to be recognised and managed accordingly. This is particularly important in large river systems such as the Condamine-Balonne.

Flow is probably the major driver of ecosystem processes, in particular, variability in the flow regime is critical. Important elements of the flow regime include the magnitude (size), frequency, duration, timing (what season etc) and rates of change (how rapidly does flow rise and fall) of flow events. The flow regime influences water quality, energy sources for the river (the food for the river life – from bacteria to birds), habitat (where plants and animals live) and biotic interactions (interactions between plants and animals) – all of which contribute to ecological integrity or well-being.

The river is more than just the river channel it includes the whole floodplain. River channels are highly dependent on their floodplains and other adjacent ecosystems. Connectivity refers to the linkages between the river channel at one place and the ecosystems all around it. Connectivity operates in three directions and connectivity changes through time (for example, with changing flow conditions):

- Longitudinal connectivity – refers to upstream-downstream connections where movement is generally from the headwater source to mouth. For example, movement of nutrients downstream. There are also upstream movements, e.g. migrations by fish.
- Lateral connectivity – refers to the connections outwards from the river between the channel and floodplains. For example the movement of organic matter, fish and macroinvertebrate movements between the river and the floodplain during high flows.
- Vertical connectivity – refers to the connections between surface water in channels and on the floodplain, with groundwater and aquifers. For example, base flows in low flow periods may be primarily from groundwater inputs.

Maintaining connectivity is fundamental to the maintenance of healthy river channels and their connected ecosystems such as wetlands and riparian zones, which collectively make up the riverine environment.

Longitudinal connectivity is reduced by the construction of dams and weirs. Lateral connectivity is reduced by river regulation, construction of levees and channels, floodplain water harvesting and by activities that result in the reclamation of floodplains for other uses including agricultural and urban development.

Floods are crucial to maintaining healthy rivers. They provide lateral connectivity and in so doing, provide many temporary habitats (waterholes and billabongs) and regenerate permanent and temporary wetlands. As flood waters move out over the floodplain they allow high levels of primary production (algae, macrophytes) and secondary production (growth of animals fuelled by algae, aquatic plants and detritus) on the inundated floodplains. Floods allow the movement of water, nutrients, sediments and biota out onto the floodplain and back to the channel.

How do you know if your river is healthy?

Speaker - Associate Professor Richard Norris CRCFE

Healthy rivers are valuable to the community because they provide:

- the source of agricultural, urban and industrial water supplies;
- processing and transport of pollutants exported from the catchment;
- recreational and aesthetic values;
- corridors for transport;
- commercial and recreational fisheries;
- regions of biodiversity.

As river health declines so does ability of the river to provide these services.

River health reflects the management of land and water in the whole catchment. Land and river management are often in conflict with river health. The result of this conflict being reduced water quality, encroachment of exotic biota, accelerated erosion, and loss of native biota.

River health needs to be assessed relative to a baseline or reference state. The reference state is usually defined as minimally disturbed or as close to that as possible. Reference however can be defined in many ways – in heavily modified rivers (like most of the lowland rivers in the Murray-Darling Basin) reference sites can be defined as sites with the best ecological condition attainable under good management practises to protect rivers (i.e. best ecological practise).

River assessment needs to be based on a conceptual model of how rivers work. Conceptual models identify critical parts of the river environment so that indices can be developed to assess these. Recent assessments river health, such as the National Land and Water Resources Audit (NL&WRA) Assessment of River Condition and the Sustainable Rivers Audit (SRA) for the Murray-Darling Basin have used conceptual models to develop assessment indicators.

Indicators of river health can be classified into driver and response indicators. The plants and animals (the biota) are response (outcome) indicators and the environmental features (water quality, habitat, hydrology) are the driver indicators. Driver indicators (e.g. flow regime, water quality and habitat) provide important insights into what is causing the current state of the response indicators (e.g. waterbirds, macroinvertebrates, fish populations). The driver indicators help diagnose problems in river health and provide insights into how river management can be improved.

The NL&WRA and the SRA have developed similar indicators for assessment of river condition:

Driver indicators

1. **Catchment disturbance** – change in land use, vegetation cover and infrastructure (not measured in SRA);
2. **Hydrological change** – mean annual flow, flood frequency, seasonal amplitude (the difference between the highest and lowest monthly flows) and seasonal period (months in which flow is conveyed);
3. **Habitat condition** – river form, riparian vegetation, and connectivity;
4. **Water quality** – suspended sediment, nitrogen and phosphorus concentrations and loads, pollutants and salinity. The SRA also uses indices of water quality that reflect biological activity (e.g. diurnal changes in Dissolved Oxygen).

Response indicator

5. **Biological condition** – macroinvertebrates using AUSRIVAS (the SRA includes a fish index).

River Health – a black and white issue

Speaker - Bob Munn

Aboriginal people have had continuous occupation of this land for more than 25,000 years and during this time have accumulated considerable knowledge and experience of how rivers function. Rivers are an integral part of aboriginal culture and life – they were constant sources of food and water, calendars, worship places, workshops, boundaries and keepers of secrets and sacred knowledge.

Aboriginal people required and had a detailed knowledge of plants and animals, their breeding cycles, food sources, growth patterns, number, distribution and harvest impact. This knowledge was the basis of a well-developed curriculum that was integral to the entire lifestyle of the people and needed life-long learning to acquire.

What do you want from a healthy river?

Open forum discussion

Those attending the River Forum audience were asked what they wanted from their river and what scientific information they would like organizations like the CRCFE to produce. A selection of responses is reproduced.

What does the community want from its river?

- *“Enough water to reach the Narran for bird breeding to continue”*
- *“A more equitable balance to be struck between consumptive water use and the environment – the environment gets too much now”*
- *“...more native fish”*
- *“A reliable water supply for towns”*
- *“Town water supply to have highest priority”*
- *“Water that is safe to swim in”*
- *“Everyone wants everything everywhere – what are our priorities?”*

What does the community want of scientists?

- *“More and better information on river health – credible, reliable evidence ...”*
- *“How much water is there for consumptive use?”*
- *“What population can be supported by the amount of water available?”*
- *“Greater recognition and understanding of the ecosystem services provided by the river”*
- *“Win-win solutions for the environment and the ecosystem”*
- *“Scientists and green movement arguments to be based on fact, not emotion”*
- *“Local knowledge should be sought to inform scientific studies – partnerships between local stakeholders and scientists are needed”*
- *“Science must be relevant to the catchment – cannot just import solutions”*

Session 1 CRC for Freshwater Ecology Summary

Declining river health reduces the ability of a river to deliver the ecosystem services that we desire.

Flow is a key driver of river function; consequently alterations in flow will impact on river function. Maintaining ecological and hydrological connectivity is critical to sustaining healthy rivers. Changes to the flow regime, construction of levees and barriers to passage such as channelisation and infrastructure for floodplain water harvesting all reduce connectivity.

River health is measured relative to a benchmark or reference state. Two types of indices are measured to assess river health: driver indicators and outcome indicators. Information from these is combined to assess river health and understand the causes of river health.

SESSION 2 - HOW HEALTHY IS THE CONDAMINE-BALONNE SYSTEM?

River health at the catchment scale

Speaker - Associate Professor Martin Thoms CRCFE

There are often very little data on the long-term changes in catchment and river processes in Australia. This is so for the Condamine-Balonne. Sediments deposited on the floodplain can provide insights into long-term changes in catchment and river processes. Floodplain sediments are indicative of the environment at the time of deposition and provide information on the climate and catchment condition at the time of deposition – they provide a library of past environmental conditions.

Analysis of sediments from the Condamine-Balonne floodplain indicates that there have been a number of changes since European settlement in the catchment including:

- Increased erosion in the catchment since the 1920's;
- Changes in the way sediments are delivered and the rate at which they are delivered from the catchment to the floodplain;
- Change in the type of sediments being supplied from the catchment;
- Changes in the nutrient status of sediments being exported from the Condamine-Balonne catchment; and,
- Worrying signs of an increase in salinity levels, especially in the lower Balonne floodplain region.

Lower Condamine-Balonne wetlands

Speaker - Dr Margaret Brock CRCFE

The condition of wetland and riparian vegetation is an indicator of river health. Condition is assessed by changes in the types of plants present: trees, emergent, submerged, floating and

amphibious aquatic plants. Changes include what's there, what's missing, what's recruiting, what's native and what's exotic.

Wetland and floodplain vegetation is threatened by erosion of the stream bank and floodplain. Sedimentation can impact instream and floodplain vegetation. Altered hydrology – changes in the timing, duration, frequency and amount, lead to changes in plant community composition. The presence of exotic plants and animals change the available plant habitat. Observations in the Narran Lakes indicate that grazing pressure has impacted on lignum.

Water Quality in the Condamine-Balonne catchment

Speaker - Linda Lee Queensland EPA

Assessments of water quality in the Condamine-Balonne include measurements of phosphorus, turbidity and pesticides and herbicides.

For most of the length of Condamine-Balonne total phosphorus concentration is greater than 0.1mg.L^{-1} , which Natural Resources & Mines (NR&M) classifies as poor. Most sites upstream of Dalby have moderate turbidity in the range 5-50 NTU while downstream of Dalby turbidity is greater than 50 NTU. Cropping and cattle grazing are the land uses that contribute the majority of sediment to the river, with cropping lands supplying proportionately more sediment per hectare than cattle grazing.

The pesticides prometryne (13-80% of samples), metachlor (63-80% of samples) and herbicide atrazine (88-90% of samples) were regularly detected in the river between Dalby and St George, often exceeding aquatic ecosystem “trigger” guidelines.

The limited information available suggests that water quality in the Condamine-Balonne is generally poor and is likely to affect some use values (though this depends on location, with some streams better than others).

Macroinvertebrates

Speaker - Dr Satish Choy CRCFE/Queensland NR&M

Macroinvertebrates have been used in the Condamine-Balonne to assess river health. As part of the National River Health Project over 30 sites have been sampled twice a year, some for 6 years and as part of the Impacts and Recovery from Drought (“Dried Fish”) project other sites have been sampled 4 times a year for two years. This sampling has been carried out in strict accordance with the nationally recognised AUSRIVAS methods.

Results indicate that most headwater sites are in good condition while the middle to lower reaches are in fair to poor condition. Macroinvertebrate diversity, richness, number of sensitive groups (EPT) and O/E taxa were generally lower than expected for a river in good condition. Conceptual models of river function indicate that community structure and function of the middle and lower reaches have been altered.

Repeated monitoring over different seasons and years indicates that while condition rating has sometimes changed over time, at a site it has mainly changed by one level (e.g. good to fair or fair to poor etc.).

Fish

Speaker - Dr Glenn Wilson CRCFE

Fish communities have been used as indicators of river health in both NSW and Queensland parts of the Condamine-Balonne, however different methods have been used by each jurisdiction (IBI

in NSW and AREPO in Queensland). While the indices reported by each are different there is considerable similarity between the methods. There are some considerable challenges in using fish as indicators of river health including their low species diversity, their varying migration patterns and the complexity and cost of sampling.

From the limited fish sampling that has been undertaken, the fish communities above Dirranbandi appear to be in fair to good condition, while the below Dirranbandi the fish community appears to be in poor condition.

The limited fish data available is reported in the Condamine-Balonne WAMP Environmental Flows Technical Report (NR&M 2000). Fish community sampling was available from seven sites for this assessment with each site sampled between five and eight times, providing reliable estimates of the ecological condition of each site. The results of this assessment resulted in a pattern of scores within the river system very similar to that attained in the NRHP study of aquatic macro-invertebrates. All of the sites examined attained “good” to “fair” scores, with the exception of a site on the Culgoa River at Weilmoringle, downstream of Whyenbah (Lower Balonne). The fish community at this site was classed as “poor”. It consistently featured relatively low numbers of native fish species and a relatively high abundance of carp throughout the two years of field sampling.

Ecological condition of the Lower Balonne

Speaker Dr Lee Benson Sinclair Knight Merz (SKM)

Sinclair Knight Merz undertook an environmental condition study of the Lower Balonne during June 2000. On one occasion 12 sites on the Lower Balonne and 2 sites on adjacent rivers were sampled once. The results indicated a generally intact riparian corridor with a low to moderate disturbance rating. Water quality monitoring indicated a turbid river with dissolved oxygen failing ANZECC guidelines at 5 out of 9 sites sampled including a control site. Fish sampling indicated a diverse fish population consistent with reference rivers. Macroinvertebrate sampling found a large variation between sites, which Dr Benson argued was probably due to habitat availability and the level of physical disturbance. SKM’s study did not find a trend of decreasing diversity downstream.

The SKM report did not support the contention that the Lower Balonne is severely degraded. The report concluded that the environment of the Lower Balonne compares favourably with nearby catchments, some of which are relatively unaffected by water resource development.

Some monitoring realities

Speaker - Dr Lee Benson SKM

The hydrological modelling that supports Water Resource Plans is generally based on years of data and extensive modelling while ecological models are often developed on limited data and expert opinion. Given the uncertainty in the available ecological understanding, the link between ecological targets and hydrological targets (IQQM statistics) is questioned. Dr Benson believes that the Water Act is in advance of reality with respect to the expectations of ecological monitoring.

It was argued that without significant baseline data, only significant changes in condition will be detected and the cause of change will still be ambiguous. He believes that highly specific ecological outcomes need to be clearly stated at the outset and these need to be monitored for.

What outcomes could be realistically expected from monitoring programs should be clearly stated by ecologists at the outset.

Session 2 CRC for Freshwater Ecology Summary

Government monitoring in the Condamine-Balonne valley describes a river that is in moderate to good condition in the headwaters but that is progressively degraded moving downstream. However, SKM's study argues that the environment of the Lower Balonne compares favourably with nearby catchments, some of which are relatively unaffected by water resource development. How can two surveys produce different results? The answer may be two-fold:

1. The macroinvertebrate (bug) data reported for the Lower Balonne in both the Condamine-Balonne WAMP Environmental Flows Technical Report and the SKM report were based on a limited number of sites sampled on only one occasion. Rivers such as the Condamine-Balonne have highly variable flows, and neither single survey can provide an accurate indication of the overall health.
2. When comparing river health survey results it is important to check that the most appropriate survey methods have been used, and whether or not the methods are actually comparable. For the WAMP report, NR&M used the national AUSRIVAS protocol which is based on comparing the bugs found at a site with those that would be found at minimally disturbed sites of similar type in the region. SKM used a simpler data analysis procedure based on 'species richness' - many ecologists consider this a less sensitive, and therefore less appropriate, indicator of river health.

Hence, the difference between the NR&M and SKM data could be due to:

- Infrequent sampling (lack of replication)
- Different methods
- Lack of method sensitivity

DNR&M has recently commenced a study of the ecological condition of the Condamine-Balonne in which a number of ecological attributes, including macroinvertebrates, are being measured at 14 sites in the Lower Balonne (30 sites in the Condamine-Balonne valley). Once the second round of sampling is completed later this year, this study will provide considerably more data on which to assess the current condition of the Lower Balonne.

There is a concern that specific ecological outcomes are needed but they will be hard to set and assess. Rather than setting specific ecological 'targets', ecological outcomes can also be defined as *trajectories* of continuous improvement (e.g. increased abundance and diversity of native fish between assessment periods). A benefit of trajectory based outcomes is that they instil a sense of continuous improvement for management. Finally, ecological outcomes should not be confused with environmental flow objectives. Environmental flow objectives are flows designed to provide the desired ecological outcome (for example, maintaining high flows to inundate a floodplain).

SESSION 3 - WHAT ARE THE GUIDING PRINCIPLES FOR LOCAL ACTION IN RIVER MANAGEMENT?

Guiding principles for ecological 'best practice'

Speaker - Professor Stuart Bunn CRCFE

What we called 'ecological best practice' 20 years ago is not ecological best practise today. Ecological best practise changes over time in response to changing community values and advances in our understanding of the environmental consequences of management both of which are often then reflected in legislation. Within this changing world, ecological best practice should conform to the principles of Ecologically Sustainable Development (ESD) and particularly to the concept of intergenerational equity.

Flow regime

Flow regime has been altered by river regulation (impoundments, extraction and levees), climate change and altering catchment vegetation. Scale is a major consideration in relation to best practice for flow regimes. Some aspects of the flow regime operate at massive scales over which local communities have little influence (eg climate change and reduced rainfall) while others operate at smaller scales and can be influenced by local communities (eg riparian zone management, construction of levees). Key principles for managing flow regime are:

- Maintaining longitudinal connectivity by minimising cumulative impacts of abstraction and harvesting and barriers to passage (e.g. weirs)
- Maintaining lateral connectivity by not isolating river from the floodplain (levee management), maintaining large flood events and maintaining small flow events that allow refilling of pools and waterholes.

Refuges

Waterholes provide refuges (places that support biota) in drier times. Refuges are areas of high conservation value and play a key role in maintenance of biodiversity. Refuges are threatened by reductions in lateral connectivity (levees, flow regime).

The shallow edge waters are critical to the ecological functioning of waterholes and this zone needs to be protected from rapid water draw down and trampling associated with stock access.

Riparian zones

Riparian zones are the last line of defence between the catchment and the river and they provide multiple roles:

- By shading the river they reduce the amount of sunlight on the water surface (which influences growth of aquatic plants and algae) and reduces water temperature;
- They are a source of energy, nutrients and snags for the main channel;
- They retain contaminants such as nutrients, pesticides and sediment and so protect the river; and,
- Vegetation improves bank stability.

Riparian zones can be protected by not allowing direct stock access or direct clearing, by appropriate weed management and not allowing de-snagging operations.

Improving River Health through on-ground actions

Speaker - Jo Voller Queensland NR&M

Throughout the Condamine-Balonne catchment a number of on-ground actions to protect and rehabilitate the river environment are occurring.

Areas of high quality riparian vegetation and drought refuges are progressively being identified and protected. Activities such as fencing and the provision of alternative stock watering points are being undertaken.

Activities to rehabilitate degraded riparian vegetation have and are being undertaken. These include fencing, weed (in particular *Lippia* and many escapee garden species such as privet) and feral animal management. Where natural revegetation is not occurring, physical revegetation is undertaken. In some areas species suitability trials are being done to identify plants that will survive in the altered riparian environments. In cases of severe erosion, stream bank stabilisation through bank battering, placement of rockfill and revegetation is occurring.

Urban stream rehabilitation is receiving increasing attention with many Town Councils taking on this responsibility. Weed, rubbish and concrete removal, storm flow management, wetland construction, water quality management and revegetation activities are being undertaken.

Restocking of native fish is done by Recreational Fishing & Restocking groups in lakes, rivers and creeks throughout the catchment. There is also limited activity focusing on introducing artificial fish habitat to water bodies.

Investigations into river health and water quality are ongoing.

Session 3 CRC for Freshwater Ecology Summary

The definition of ecological best practice will continue to change into the future reflecting both community attitudes and an increased understanding of the environmental consequences of land and water management.

Currently, ecological best practice includes maintaining lateral and longitudinal connectivity, protecting refuges and maintaining and where appropriate rehabilitating riparian zones.

In the Condamine-Balonne many of these activities are occurring – with many examples of protection and rehabilitation of the riparian zone and refuges. Significant challenges remain including weed and pest control and maintaining lateral connectivity.

AUDIENCE SURVEY SUMMARY

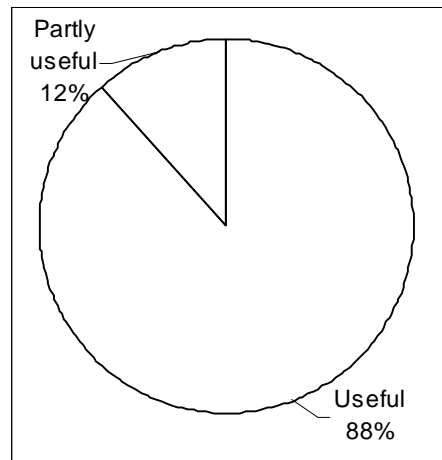
One hundred and ten people attended the forum, including farmers, representatives of irrigation organisations, council members, government-employed natural resource managers, thirteen speakers, environmentalists and others. The CRC for Freshwater Ecology would like to thank all the participants for their interest and involvement.

Audience members were keen to gain clear, reliable information about the health of the Condamine-Balonne and many participants expressed strong concerns about water issues and management in the Condamine-Balonne Valley. As you would expect, a variety of interests, expectations and views were expressed throughout the day.

Most of the audience found the forum informative and useful, as confirmed by a survey of participants on the day. 51 people completed survey forms (54% response rate). The information below is based on these evaluations. Note: where responses total more than 100%, some people have given more than one answer.

Did you find today's forum useful?

Most people found the River Health Forum useful (88%) or at least partly useful (12%). Significantly, no one answered that they hadn't found the day useful:

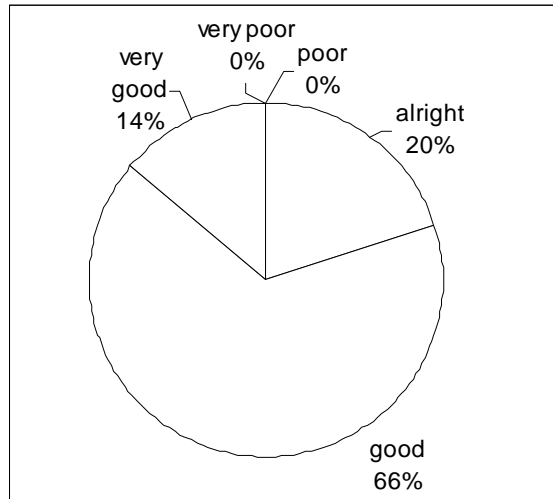


Comments included:

- *“Valuable update on scientific findings... It broadened my knowledge”*
- *“Great, informing debate. Good general summary”*
- *“Useful cross fertilisation of ideas. Interesting to see conflicting ideas in the audience”*
- *“Valuable explanation of the lack of data and difficulties around ecological health targets”*
- *“Wanted more specific information on Condamine-Balonne”*
- *“Too many speakers in too short a time”*

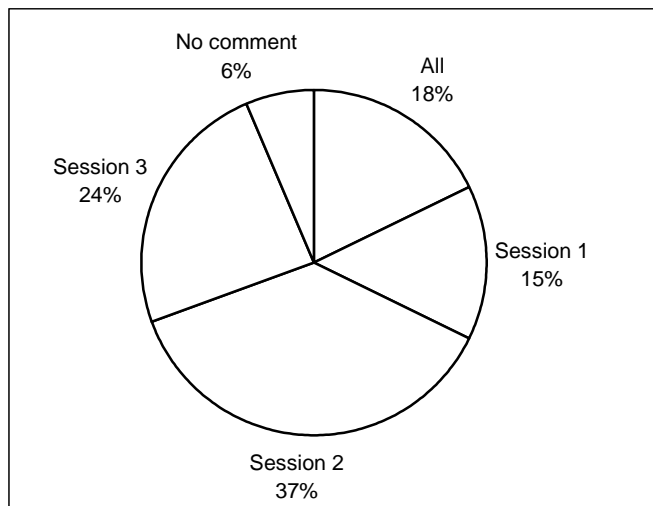
Overall rating of the River Health Forum

A large majority of people found the Forum very good or good (80%). On a rating scale of 1-5, no one rated the Forum as 1 (very poor) or 2 (poor):



Which sessions were most useful for you?

A majority of respondents (37%) found session 2 the most useful, followed by Session 3 and then all sessions. Session 2 focussed on the health of the Condamine-Balonne Valley.



Comments included:

- *“The first session was an excellent framework for discussion”*
- *“Session two was most relevant and should have been longer”*

The most important things participants learnt were...

- “River health is complex”
- “The different factors affecting river health, including connectivity”
- “Good introduction to concepts and science”
- “Useful to understand different ways to view data, comparison of data”
- “Examples of best practice”
- “Importance of riparian zone”
- “Who to contact for what research findings”
- “Importance of rivers. Limited water resource”
- “Difficulty of monitoring cause and effect”
- “The difference between what landholders want from research and what can be delivered at present”
- “More data needed to make firm decisions”

Important issues that weren't discussed:

Responses varied, but a strong theme was the desire for more concrete information about the health of the Condamine-Balonne, thresholds and the effects of irrigation on the C-B:

- “Balance of ecology vs social vs economic aspects”
- “WAMP process and background”
- “How is irrigation affecting the river?”
- “People--how will we cope if major changes are needed?”
- “Landholders perceptions and perspective--growers won't accept own biases”
- “Dodged the hard questions: What is health of Condamine-Balonne?”
- “Thresholds--how far can we push a system before irreversible damage is done?”
- “Partnerships between scientists and stakeholders”
- “Interpretation of some of the data”

The main disappointments in the Forum were:

39% of respondents said they had no disappointments with the day. Other responses varied, including:

- “Not good approach for audience participation...groups would have worked better...use workshop methods”
- “Some terms too technical”
- “Not enough time on specific data and conflicts over data...limited time for questions”
- “Few suggestions for improvements to current land practices”
- “Would have been nice to have stakeholder on the panel”
- “Swinging discussion to water allocation”

Suggestions included:

- “Use information from practitioners, eg. farmers and link to research findings”
- “More discussions and forums needed”
- “Get better/more data”
- “Presenters should have visited catchment and used local photos”
- “More links between scientists and community...community actions”

In closing

- The Forum could be usefully followed up - if feasible - by specific, practical workshops on topics chosen by the community. Some participants requested a workshop on best practice for local actions, such as riparian restoration/conservation strategies and funding possibilities. People wanted more opportunities and time to discuss their particular interests with a specialist and the chance to learn about successful management activities from other people. This information could be delivered through a variety of formats, such as face to face workshops, web forums, fact sheets etc.
- Participants would like to be kept informed of new findings about the health of the Condamine-Balonne Valley.
- One message that came out strongly through the day was the strong interest people have in working together with scientists, on both local actions and larger scale projects, with the proviso that local knowledge and expertise is valued. The CRC for Freshwater Ecology made some valuable links with community members who are willing to be involved in research based at the Goondiwindi laboratory.
- Many participants would have liked unequivocal answers to questions such as:
 - “How much water is there and how much water can we use without causing irreversible damage?”
 - “How is irrigation affecting the health of the river?”
 - “Can we have an index of river health, like the All Ordinaries or the weather report on TV, so we can find out how the Condamine-Balonne is going?”

Some parts of the community clearly remain sceptical and uncertain about the scientific disagreements, and lack of robust information on the health of the Condamine-Balonne. However, the survey results indicate that most participants found the day beneficial, and that they came away with a better understanding about the complexities of river ecosystems and ecological assessment.