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Andrew Dolling
Great Barrier Reef Study
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Dear Andrew,

Re: Submission - Industries in the GBR Catchment and Measures to Address Declining Water Quality

As promised please find attached my submission to the Productivity Commission's report on declining water quality in the GBR Catchment. I make this submission as an independent person who has an interest in protecting our environment (particularly water quality) and achieving sustainable uses in our catchments.

My background is that I am a semi-retired consultant who has been involved in senior management in nature conservation and primary industries organisations. Prior to my retirement I chaired the Queensland Integrated Catchment Management Coordinating Committee. Currently I Chair the Great Barrier Reef Marine Park Reef Advisory Committee on Water Quality and Coastal Development and I am involved in reviewing the performance of the National Land and Water Resources Audit. My comments relate mostly to improving catchment management and in particularly addressing the rural issues causing degradation of water quality.

I was pleased to see the Commission take on this task and I hope your report leads to improved coordination and implementation of policies and action programs aimed at improving water quality in our coastal rivers, estuaries and the Great Barrier Reef.

Yours sincerely

Noel Dawson
11 September 2002

Submission
Productivity Commission's Inquiry into:

"Industries in the GBR Catchment and Measures to Address Declining Water Quality"

This submission draws heavily on material presented at the "Sustaining our Aquatic Environments" (SAE) conference held in Townsville last November. A listing of the papers prepared for this conference is attached (Attachment 1). Whilst these papers have not been published copies of the papers are available either by contacting the authors or by contacting Clare Porter of the Australian Water Association (Phone 0294131288 or e-mail cporter@awa.asn.au). We are currently finalising editing of the papers and 90% are in their final form. We expect to publish these in the next few months. The draft papers are available on CD and Clare Porter has copies of those papers that have been edited. This conference addressed many of the issues raised in the Issues Paper.

Due to time constraints I have not tried to provide detailed data from these papers but rather tried to give an overview and provide you with the references. A workshop at the end of the conference addressed institutional arrangements and I have attached a copy of the summary from this workshop (Attachment 2).

Finally my qualifications relate particularly to developing sustainable resource use in rural catchments so this is the main emphasis in this submission.

Q 1 and 2. *Nature and extent of research and monitoring? Agreement and disagreement. Examples of deteriorating water quality.*

The SAE conference papers (1 Reichelt and Shaw, 2-2 Prosser et al, 2-2 Brodie and Furnas, 3-1 Ash and Quirk, P2-3 Clarke, P2-4 Cogle et al, P2-5 Conrick et al, P2-6 Cox et al. P2-8 Devlin et al, P2-10 Humphrey et al, P2-12 Mc Culloch and Fallon, P2-19 Zethoven and P3-2 Brodie et al provide a good summary of the R&D, monitoring and health of the GBR.

These papers together with the "Great Barrier Reef Water Quality Plan" and GBRMPA Research Publication "A Review of Water Quality Issues Influencing the Habitat Quality in Dugong Protection Areas" provide much of the information required to support the decline in water quality caused by unsustainable catchment management. You will have contacted a number of the authors but I believe you may find some additional contacts from this list. Some of the posters that are available on the CD also provide valuable information not yet published.

As mentioned on the phone the National Land and Water Resources Audit (NLWRA) reports are also a major source of information relating to land use and land management impacts on the quality of water running into the GBR World Heritage Area. I believe you have contacted Col Creighton to access the reports and information assembled by the Audit.

Some may argue that the impacts of catchment land use and management on the GBR reefs have not been proven beyond doubt. However what is beyond doubt (based on the conference papers and the NLWRA report) is that the water quality from catchments running into GBRWHA water

have declined and the WHA is definitely under threat from these changes. There are well-documented examples of the negative impacts on the reefs and inshore waters making up the WHA. Even more important is the fact that the change in water quality from catchments can be attributed to unsustainable land use and land management practices. Priority areas for action have been identified.

In the GBR rural catchments the major causes water quality degradation are:

- Inappropriate land use (clearing land susceptible to erosion, dryland salinity or providing protection of stream banks, drainage of filter-belts and wetlands and development of Acid Sulphate Soils;
- Inefficient and inappropriate use of water, fertiliser, pesticides and herbicides;
- Reduction in vegetative cover (overgrazing of land and removal of protective stubble and trash on cropping lands; and
- Changes to stream flows and direct routing of drainage and waste-water into streams.

Resource management and the land use changes required to address these unsustainable uses are well documented but often this information has not been turned into local Best Management Practice (BMP) and implemented by land users. This is despite the commitment of Industry organisations to BMP and Environmental Management Systems (EMS). In some cases those catchment uses causing the problems are uneconomic or marginally economic and a significant proportion of land-users are unable to make the changes to achieve sustainable use.

As mentioned earlier the NLWRA reports give a national perspective of sediment and nutrient problems by catchments. They also try to develop economic analysis of these catchments in terms of Profit at full equity, net economic return and the area of the catchment required to achieve 80% of profit at full equity. What this data indicates is that the implementation of BMP alone will not solve the rural problems. The seriousness of the problems and the low returns in some catchments indicate that major rural reconstruction is required to address the issues and in some cases major changes in land use will not significantly affect net income in the catchments.

Each catchment has its own specific issues to address and the approaches being used by Integrated Catchment Management, NAP and NHT2 will help target the main issues. However these programs will not achieve their full impact unless there is a clear understanding of the capacity of land users to change, the economic and social blockages to implementing BMP, adequate resources to make the changes and time to implement programs. Whilst many of the land use and management changes will benefit the land users these programs will need to consider funding for incentives and rewards to encourage changes to BMP and compensation where a lawful right to use a resource (where this use is sustainable) is removed.

By far the most economic approach to preventing further degradation is for the Queensland, commonwealth and local governments and industries to take preventative actions to ensure that land is not developed unless the land can be used sustainably and sustainable practices are implemented at the outset.

Q 3. *Meeting obligations.*

Deterioration in the health of the GBR is not an option that should be considered. Not only are we committed to protection of the GBR by law but also the majority of Australians would not want to see any reduction in values.

Much of the growth in tourism in Queensland has been based on the GBR and the GBR catchments. GBRMPA data indicates that the value of GBR tourism is estimated to be $770 million (Total impact $1,463 million) and employment at least 9% of the workforce higher than the industries threatening the GBR. Total value of tourism, fisheries (undervalued) and recreation is estimated to be $1,094 million (Total impact $2,078 million).

Experience from overseas where reefs have been degraded by catchment practices show that the cost of reinstating healthy reefs is extremely high. For example Causey (SAE Paper 3-2 Causey) identifies the cost of restoration of the everglades (to protect the Florida Keys reefs and other ecosystems) to be $US8.3 billion and this will take 20 years.

For this reason preventative action is a much better option than cure.

Q 4. *Regional investigations*

Data presented by the NLWRA, the SAE conference papers (P2-8 Devlin et al and P3-2 Brodie et al) and the GBRMPA Water Quality Action Plan indicate the priority catchments and land uses for action to prevent further degradation of water quality. They also show the differences in contributing problems for each catchment and the likely impacts of changes. There are big differences in economic viability, capacity to change and likely impacts of reconstruction across the catchments and more detailed studies such as the Productivity Commission Report could draw this out. Some catchments are also moving towards action program. The Commission could take advantage of these differences.

Three catchments that would capture this diversity would be Pioneer, Burdekin and Johnstone.

Q 5, 6 & 7. *Economic and social indicators*

Whilst the indicators mention are practical and available I think we can draw on some of the case studies used by the NLWRA in determining net return for catchments (ie take into account some of the government inputs). Also the Audit attempted to value the losses of "business as usual" against improved management scenarios and this helps capture the "losses" of unsustainable uses that are threatening the GBR. The Profit at full Equity figure used by the Audit would be more useful if it could factor in debt.

Interpretation of employment data to justify maintenance of degrading industries in critical areas should be avoided. There are plenty of examples in Queensland where reconstruction of poorly performing industries has lead to improved economic performance and resilience of communities and improved resource management.

Q 8 & 9. *Data sources*

No comment

Q 10. *Regions*

Whilst it would be desirable to present the information by catchments this disaggregation is appropriate for this study.

Q 11 – 14. *Growth projections*

Any projections of rural production should factor in the availability (or lack of) of suitable land and water and the likely reductions associated with rural reconstruction and improved land use. The opportunity for improvements in production using BMP and the possible benefits of improved price for products derived from BMP should also be considered even those these have not been realised to date.

Q15 -17. *Land use and land management practices*

Some of the practices being used or planned are outlined in SAE papers **(**3-1 Ash (grazing), 3-1 Reghenzani (sugar), 3-1 Hunter (riparian zone), 3-1 Bruce (urban), 3-2 Casey (rural industries) P3-8 McCallum and Quirk (grazing) P3-14 Roth et al (grazing) and P3-21 Vitelli and Landsberg**)**. Most of these papers concentrate on management practices. It is also important that land use is consistent with land capability (eg: land susceptible to erosion and salinity should not be cleared, wetlands should be protected and filter belts along streams should be maintained).

There are many areas where land will need to be removed from use or revegetated (wetlands, acid sulphate soils, erosion prone areas and areas contributing to soil salinity. Also access to irrigation water is likely to become limited in some areas where Water Management Plans are implemented and there is competition from other high value uses.

The major changes in land management practices that could improve water quality in the GBR lagoon are:

- Reduction in sediments by maintenance of cover, controlled traffic, and soil conservation practices on cropping lands;
- Grazing management practices to maintain protective cover;
- Fertiliser application levels that don't exceed needs of crop, application techniques that reduce losses through runoff and drainage and types of fertilisers that are suited to soils;
- Improving water use efficiency (irrigation and rainfall) thus preventing runoff and drainage (eg: efficient application techniques that match soils and crop type, water scheduling, evaporation management, and recycle waste water and drainage water); and
- Use of approved pesticides and herbicides that don't impact on aquatic species and use of practices that minimise losses through runoff and drift into waterbodies.

These need for these improved practices are recognised in Industry Codes of Practice, BMP and EMS's however implementation is slow even where there are short and long term economic benefits. Most industries rely on self auditing of BMP but there is a need for independent auditing

of BMP and monitoring programs to demonstrate the value of BMP to land users, provide management feedback and develop confidence in the industries.

The NAP and NHT2 programs and state programs such as RWUE (Rural Water Use Efficiency) are focussed to address these issues but more recognition needs to be given to removing the blockages to implementation of these programs, time that takes to make change and the real costs of change.

Q 18 – 20. *Policies*

The use of targets as a management tool to improve performance is strongly supported. However to be effective and be owned they need to be developed with those who will be expected to make the changes to achieve these. To achieve community and industry acceptance of water quality targets, a clear justification of the level of benefit derived from any given set of targets should be provided in the triple bottom line format, utilising best available knowledge. To gain wide acceptance of a Plan to achieve the targets, the feasibility of the proposed actions in meeting the targets within specified timeframes should be justified with the best science and technologies currently available. Careful policy consideration and adequate support programs will be required where proposed actions are likely to impact significantly on particular sectors of the community.

A major concern with the GBRMPA Action Plan was the lack of involvement of Stakeholders in the development of the document. Whilst GBRMPA were criticised for their approach it should be realised that the development of this document was needed to spur those who should be acting to improve water quality to act. It did highlight the need for the Commonwealth, the State and other sectors to engage in a proper process to develop a Priority Action Plan with agreed targets in catchments to protect water quality in the catchments of the GBR World Heritage Area. Efforts should initially concentrate on refining the risk assessment in conjunction with catchment groups so that they can develop remedial and preventative action programs in the high-risk areas.

Since then emphasis has been placed on the National Action Plan for Salinity and Water Quality and the Queensland Reef Protection Plan as mechanisms to achieve agreed targets. These are strongly supported but I have some concerns about the ability of these processes alone to develop an adequately resourced Action Plan for catchments draining into the WHA. A comprehensive approach is needed (including developing awareness, development of partnership agreements to meet targets, incentives, compensation, structural adjustment, education, training, regulation, planning, R&D to fill gaps in information and performance monitoring).

In regard to the use of statutory targets and greater use of statutory processes I feel that wherever possible cooperative agreements are preferred for improving land and water management practices. Statutory processes have a role to play in preventing and controlling land uses, protecting critical areas and controlling processes that threaten the WHA. Any regulation should be based on sound science and information and be objective. It should not stifle innovative ideas that could provide the same desired outcome.

Policies and implementation programs that encourage the use of simple monitoring processes to allow management and land users to evaluate their performance and adapt plans and practices are needed. The development of an independent water quality monitoring and reporting program for the GBR and GBR catchments is also supported. This should be developed in cooperation with Queensland agencies, NLWRA and land users to prevent duplication, reduce costs and be useful.

Protection of the GBR has tended to concentrate on technical issues and solutions. However experience tells us that most of the barriers to implementation of plans such as this are social and economic issues. Future planning should draw on the experience of social scientists to identify the barriers to implementation of improved land use, develop ownership and suggest ways to improve and speed implementation.

Reconstruction of properties that cannot implement BMP due to financial or other constraints should be given priority in any program aimed at improving water quality. Where possible land unsuited for production or needed for protection of water quality should have covenants placed on them before reallocation to others if government funds are used to drive reconstruction.

Where practical local and state governments should consider incentives / disincentive to those who meet / don't meet BMP. This could be applied to rates, rent, allocated rights (water, clearing etc) and resource security.

Q 21. *Institutional arrangements*

A workshop at the end of the SAE conference identified many of the concerns about government program and the summary of this workshop are attached (Attachment 2).

There is genuine need for realistic engagement of land users in planning the implementation of projects and programs, and a need for actions to increase the capacity (both human and economic) of land users to be involved in the planning and implementation of change.

There is widespread concern about the plethora of Commonwealth, State and Regional government programs and legislation in regard to sustainable resource use and management. Whilst there are some positive signs in this area with the Queensland and Commonwealth Governments jointly involved in the Reef Protection Plan and developing MOU's responsibilities are blurred even within jurisdictions and it is difficult for land-users and even government officials to keep abreast of legislation and requirements of them. There is considerable waste due to duplication of effort, poor "big picture" targeting of programs and point-scoring across jurisdictions. There is no agreed long-term vision of where we want to be as a Nation or how this might be achieved strategically.

The current State government actions to develop a Reef Protection Plan and the preparation of MOU's between the State and Commonwealth are steps in the right direction. The National Action Plan (NAP) initiative on salinity and water quality is also seen as a move in the right direction however implementation has been slowed by a lack of cooperation and definition of "territory". The time is right for an independent review of State, Commonwealth and Regional government responsibilities to simplify processes, develop cooperative arrangements and clearly identify responsibility for the stewardship of our natural resources.

Development of local and/or industry led partnership programs are more likely to share responsibility for problems and actions and achieve meaningful involvement and ownership by the community. A win /win outcome is more likely. The well funded Moreton Bay / Brisbane River experience has been cited as a good example. However, both Commonwealth and State programs still seem unable to adequately support local / regional / industry programs. New funding sources need to consider new catchment / regional /local levies for works of public benefit.

Current NRM action plans and R&D projects have limited input from people who have practical, social and economic skills to:

- Understand the blockages and drivers to the implementation of improved land use and management practices;
- Convert technical information into knowledge and develop ownership for actions;
- Identify and create awareness of the economic and social benefits of taking action;
- Use targeted communication processes that are appropriate for communities and those being required to make changes;
- Plan cultural change; and
- Remove the culture of blame and replace it with cooperative approaches.

Many people feel that government and R&D programs do not lead to effective transfer of information to end users in a way that they can see the benefits to them in implementing changed practices. The sheer volume of messages being sent and a move away from extension services and other more personal approaches further complicates this.

The top priority recognised in the SAE conference workshop identified the need for greater use of targeted demonstration sites. However, this was only an example of many important elements recognised by the groups that could be used to extend practical solutions based on good science to the community as a whole. The use of social scientists in the planning of R&D and action plans can help build ownership and develop appropriate extension and communication approaches. Funding commitments are needed for these activities, as they also need resources to research clients and develop appropriate processes to involve clients in the planning and implementation phases.

Similarly economic assessment of the benefits of taking action needs to be incorporated into projects. Whilst this sounds like common sense the reality is that little effort is put into outlining the economic benefits and costs of actions to improve sustainability. An example of this was the difficulty that the NLWRA had in assembling data on the economic costs and benefits of addressing land and water degradation, despite a concerted effort. This information is also needed to help develop cost sharing and compensation arrangements and evaluate the use of mechanisms such as structural adjustment, incentives etc. If a big picture approach is not taken then often real outcomes are not achieved.

There are already many groups making greater use of social and economic skills to speed adoption of R&D and plans, but their use in action planning projects aimed at improving land use and management is not widespread.

Improving water quality in the catchments of the WHA benefits all those communities not only those dependent on the WHA. However the conservation, tourism, commercial and recreational values of the WHA alone far exceed the value of some of the uses adversely impacting on water quality and this needs to be kept firmly in mind in the funding and development of a coordinated approach.

Sustaining Our Aquatic Enviroronment Conference Papers (Attachment 1)

Session	Theme No	First Name	Last Name	Organisation	Position	E-mail	Paper Title	Copyright Received?	Poster PDF	Presentation	Final Manuscript	Disk	Reviewed	E-mail sent for chaseup 4/3/02
Invited	1	Jay	O'Keeffe	Rhodes University	Director, Inst. For Water Research	jay@iwr.ru.ac.za	Global Drivers and status of the world's aquatic ecosystems				Yes	E-mail		
Invited	1	Russell	Reichelt	CRC for Reef Research Centre		crcreef@jcu.edu.au	Source-to-Sea - The potential for integrated approaches to the GBRWHA				No			Yes
Invited	1	Roger	Shaw	CRC for Coastal Zone, Estuary and Waterway Management	Chrief Executive Officer	Roger.Shaw@dnr.qld.gov.au	Source-to-Sea - The potential for integrated approaches to the GBRWHA				No			Yes
Invited	2-1	Wendy	Craik	Earth Sanctuaries Ltd	CEO	wendy.craik@esl.com.au	The important of aquatic resources to industries and their future needs	Yes		Yes	Yes	Yes		
Invited	2-1	Graham	Harris	CSIRO Flagship Programs		gharris@csiro.com.au	Interactions between land use change in catchments and ecosystem responses in estuaries and coastal waters				Yes	Disc		
Invited	2-2	Jon	Brodie	Great Barrier Reef Marine Park Authority		jon.brodie@jcu.edu.au	Status and trends of inputs from GBR catchments and impacts on the Reef			Yes	Yes	Yes		
Invited	2-2	Max	Finlayson	Environmental Research Institute of the Supervising Scientist		maxf@eriss.erin.gov.au	Status of Wetlands in Northern Australia				Yes			Yes
Invited	2-2	Miles	Furnas	Australian Insitute of Marine Science		m.furnas@aims.gov.au	Report card on Northern Australia's inshore marine environments			Yes	Yes	Yes		Yes
Invited	2-2	George	Lukacs	James Cook University		George.Lukacs@jcu.edu.au	Status of Wetlands in Northern Australia				Yes			Yes
Invited	2-2	Richard	Norris	University of Canberra		norris@lake.canberra.edu.au	Health of Northern Australian Coastal Rivers			Yes	Yes	Yes		
Invited	2-2	Ian	Prosser	CSIRO Land and Water		ian.prosser@cbr.clw.csiro.au	Sediments and Nutrients in Tropical Coastal Systems			Yes	Yes	Yes		
Invited	2-2	Jim	Tait	National Land and Water Resources Audit		jim.tait@nlwra.gov.au	Condition of Northern Australia's Coastal Catchments			Yes	Not handing one in… too much work on	Yes		
Invited	2-2	Lynne	Turner	Qld Dept of Natural Resources		lynne.turner@dnr.qld.gov.au	Condition and Trend of Australia's Northern Estuaries			Yes	No	Yes		Yes
Invited	2-2	David	Williams	CRC for Reef Research Centre		d.williams@aims.gov.au	Report card on Northern Australia's inshore marine environments			Yes	Yes	Yes		Yes
Invited	3-1	Eva	Abal	University of Queensland		vseabal@mailbox.uq.edu.au	Moreton Bay				No			Yes
Invited	3-1	Andrew	Ash			andrew.ash@cse.csiro.au	Grazing management and health of woodland savannas			Yes	Yes	Yes		
Invited	3-1	Martin	Breen	APFA		info@apfa.com.au	Managing the environmental impacts of aquaculture				No		Martin Breen - not submitting paper	Yes
Invited	3-1	Greg	Bruce			GAB@Townsville.qld.gov.au	Mitigation of urban and industrial run-off - a Townsville example			Yes	Yes	Yes		
Invited	3-1	Heather	Hunter			heather.hunter@dnr.qld.gov.au	Wetlands as sinks for sediments and nutrients			Yes	80% complete	Yes		Yes
Invited	3-1	Ron	Johnstone	University of Queensland		rnje@uq.edu.au	Processing of materials in tropical marine ecosystems (including mangrove and estuaries)				No			Yes
Invited	3-1	George	Lukacs			george.lukacs@jcu.edu.au	Riparian zone management in tropical river systems				No			Yes
Invited	3-1	Mark	Lund			m.lund@jcu.edu.au	Lower Ord River				Yes	E-mail		
Invited	3-1	Richard	Pearson			richard.pearson@jcu.edu.au	Processing of materials in tropical freshwater ecosystems (including wetlands)				No			Yes
Invited	3-1	John	Reghenzani			Jreghenzani@bses.org.au	Managing pollution sources in floodplain environments				Yes			
Invited	3-1	Robert	Wasson			robert.wasson@anu.edu.au	Herbert River Catchment				No intention to submit			Yes
Invited	3-2	Brianna	Casey	Qld Farmers Federation		brianna@qff.org.au	Industry Codes and Best Practice - Progress, outcomes and other industry actions to protect aquatic environments			Yes	Yes	Yes		
Invited	3-2	Billy	Causey	Florida Keys National Marine Sanctury	Superintendent	billy.causey@noaa.gov	Implementing programs to improve the sustainability of aquatic environments				Yes			
Invited	3-2	Allan	Dale			allan.dale@dnr.qld.gov.au	Regional Planning - Lessons in Australia				Only background information provided			Yes
Invited	3-2	Ross	Dalton	AFFA	NRM Policy	ross.dalton@affa.gov.au	Effectiveness of Government Programs as tools to drive change and improve sustainability			Yes	No	Yes		Yes
Invited	3-2	Sheriden	Morris	GBRMPA		sheriden@gbrmpa.gov.au	Benchmarking Pollution Entitlements in the GBR Catchement - the task ahead for Natural Resource Managers			Yes	No	Yes		Yes
Invited	3-2	David	Wiskar	EPA		david.wiskar@env.qld.gov.au	A better business as usual - cleaner production and economic efficiency achievements in Queensland				Yes	E-mail		
Invited	4	Stephen	Dovers	Australian National University		stephen.dovers@anu.edu.au	Policy and institutional challenges for sustainability				No			Yes
Poster	1_01	Ben	Jacobsen	James Cook University	School of Business	ben.jacobsen@jcu.edu.au	Issues in the implementation of nonpoint source pollution mitigation: A case study of potential expansion of the sugar industry in North Queensland	Yes	Yes		Yes	Yes		
Poster	2_01	Garry	Bennison	ECOWISE Environmental P/L	Principal Consultant	gbennison@ecowise.com.au	Impact of Treated Wastewater Effluent on Three Estuaries and Two Freshwater Rivers in Cairns, Queensland				No			
Poster	2_02	Heiko	Bohl	CSIRO Land and Water	Davies Laboratory Townsville	Heiko.Bohl@tvl.clw.csiro.au	Dissolved Oxygen Monitoring in Waterways in Sugar Cane Growing Areas in North Queensland	Yes	Yes		No	Yes		
Poster	2_03	Roger	Clarke	Department of Natural Resources and Mines		roger.clarke@dnr.qld.gov.au	Trends in total nitrogen loadsin streatms discharging to the GBR		Yes		Yes	Yes		
Poster	2_04	Lex	Cogle	Department of Natural Resources and Mines	Senior Soil Conservationist	lex.cogle@dnr.qld.gov.au	Sediment and nutrient movement a tropical catchment with multiple land-use		Yes		Yes	No		
Poster	2_05	Diane	Conrick	Department of Natural Resources and Mines	Scientist	Diane.Conrick@dnr.qld.gov.au	An Assessment of the Ecological Condition of Two River Systems in Northern Queensland	Yes	Yes		Yes	Yes		
Poster	2_06	Melanie	Cox	Environmental Protection Agency	Waterways Scientific Services, Environmental and Technical Services Division	Melanie.Cox@env.qld.gov.au	Water Quality Condition and Trend in North Queensland Waterways	Yes	Yes		Yes			
Poster	2_07	Diana	Dawson	Environment and Natural Resources	Research Assistant	Diana_Dawson@canegrowers.com.au	Past Initiatives, Future Directions – Sugar Cane Growers Working to Protect the Environment		Yes		No			
Poster	2_08	Michelle	Devlin	Great Barrier Reef Marine Park Authority		jon.brodie@jcu.edu.au	Exposure of Great Barrier Reef inner-shelf reefs to river-borne contaminants		Yes		Yes	Yes		
Poster	2_09	James	Ray	Department of Natural Resources and Mines		James.Ray@dnr.qld.gov.au	Impact of Acid Sulphate Soils on River Water Quality in Sub-catchments of the Pimpama Area	Yes	Yes		Yes	Yes		
Poster	2_10	Craig	Humphrey	Australian Institute of Marine Science		c.humphrey@aims.gov.au	Monitoring the health of tropical estuaries using fish as biological indicators		Yes		Yes	Yes		
Poster	2_11	Linda	Lee	Environmental Protection Agency	Senior Environmental Officer	LindaJ.Lee@env.qld.gov.au	Water quality objectives - turning policy into reality	Yes	Yes		Yes	Yes		
Poster	2_12	Malcolm	McCulloch			Malcolm.McCulloch@anu.edu.au	Terrestrial Runoff into the Great Barrier Reef: Direct Evidence from the Coral Record for Major Increases in Anthropogenic Fluxes		Yes		Yes	Yes		
Poster	2_13	Viviene	McNeil	Department of Natural Resources and Mines			Developing catchment management targets, using continuous in-stream electrical conductivity data		Yes		Yes	Yes		
Poster	2_14	Alan	Mitchell	AIMS		amitchel@aims.gov.au	Nutrient and sediment fluxes from the Fitzroy River Catchment		Yes		No	Yes		
Poster	2_15	George	Rayment	CRC for Sustainable Sugar Production	Principal Scientist, SS&D, DNR & Leader, Protecting the Environment Program	George.Rayment@dnr.qld.gov.au	Modelled Estimates of Sediment Yield for Sub-basins of the Fitzroy Catchment and from Land Use Changes Expected Due to the Proposed Nathan Dam on the Dawson River		Yes		Yes			
Poster	2_16	Donna	Rayner	Central Queensland University	Research Officer, Yarwun Targinnie Sustainability Project	d.rayner@cqu.edu.au	Sustainable Horticulture - Sustainable Waterways		Yes		Yes	Yes		
Poster	2_17	Jeremy	Taylor	James Cook University		winhound@ozemail.com.au	Water quality dynamics in a tropical north Queensland estuary		Yes		No	Yes		
Poster	2_18	Peter	Wallbrink	CSIRO Land and Water		peter.wallbrink@cbr.clw.csiro.au	An assessment of the delivery of sediment and P to waterways in a mixed landuse tropical catchment – identifying opportunities for improved management		Yes		No	Yes		
Poster	2_19	Imogen	Zethoven	WWF Australia		izethoven@wwfqld.org	Water Quality in the Great Barrier Reef World Heritage Area	Yes	Yes		Yes	Yes		
Poster	3_01	Myriam	Bormans	CSIRO Land and Water		myriam.bormans@cbr.clw.csiro.au	Simple Estuary Response Model		Yes		Yes	Yes		
Poster	3_02	Jon	Brodie				Developing catchment pollutant load targets for the protection of the Great Barrier Reef		Yes		Yes			
Poster	3_03	Linda	Cobiac	The University of Queensland	Department of Mathematics	l.cobiac@mailbox.uq.edu.au	Decision Support for Integrated Management of Urban Stormwater in Coastal Catchments		Yes		Yes	Yes		
Poster	3_04	Freeman	Cook	CSIRO Land and Water		Freeman.Cook@dnr.qld.gov.au	Semi-Empirical Model of Acid Generation and Discharge of Acidity from Acid Sulfate Soils – FLASH1	Yes	Yes		Yes	Yes		
Poster	3_05	Bryan	Green	Broadwater Sugar Mill	Water Quality Officer	bgreen@bses.org.au	What's Coming Off Canelands? – A participative approach to improving water quality from cane drains		Yes		No			
Poster	3_06	Louise	Johns	Northern Fisheries Centre	Fisheries Biologist	JohnsL@prose.dpi.qld.gov.au	Fish Habitat Code of Practice – Enhancing Fish Habitats in Sugar Cane Drains		Yes		No			
Poster	3_07	Tim	Marsden	Queensland Department of Primary Industries	Northern Fish Community and Fishway	Email marsdet@dpi.qld.gov.au			Yes		No	Yes		
Poster	3_08	Brigid	McCallum	Queensland Beef Industry Institite, DPI		McCallB@prose.dpi.qld.gov.au	Decision tools and ecologically-based guidelines for the sustainable management of the Upper Burdekin Catchment grazing lands		Yes		Yes	Yes		
Poster	3_09	David	Post	CSIRO Land and Water	Research Scientist, Davies Laboratory	David.Post@clw.csiro.au	Modelling water movement in the Ripple Creek catchment		Yes		Not producing paper			
Poster	3_10	Brian	Prince	Ord-Bonaparte Program	CEO	brian.prince@lwa.gov.au	The Ord-Bonaparte Program: supporting the sustainable management of water and other natural resources in the East Kimberely Region		Yes		Yes	Yes		
Poster	3_11	George	Rayment	CRC for Sustainable Sugar Production	Principal Scientist, SS&D, DNR & Leader, Protecting the Environment Program	George.Rayment@dnr.qld.gov.au	Acid Sulfate Soils in New South Wales - From an Environmental Problem to Routine Management		Yes		Yes	Yes		
Poster	3_12	Mark	Ramage	Catchment and Regional Planning	Senior Project Officer	Mark.Ramage@dnr.qld.gov.au	Queensland Implementation of the NAPSWQ – the role of Targets		Yes		Yes			
Poster	3_13	Ken	Rohde	Dept. of Natural Resources and Mines	Soil Scientist	Ken.Rohde@dnr.qld.gov.au	Neighbourhood Catchments: Integrating land management research, geographic information systems and extension to achieve change in the aquatic environment	Yes	Yes		Yes	Yes		
Poster	3_14	Christian	Roth	CSIRO Davies Laboratory Townsville	Officer-in-Charge, and Leader, Tropical Land and Water Management Program	Christian.Roth@clw.csiro.au	Grazing, soil surface condition and sediment and nutrient runoff from tropical savanna woodlands of north eastern Queensland	Yes	No		Yes			
Poster	3_15	Christian	Roth	CSIRO Davies Laboratory Townsville	Officer-in-Charge, and Leader, Tropical Land and Water Management Program	Christian.Roth@clw.csiro.au	A targeted approach to managing sediment and nutrient export from caneland in the Herbert using a sediment budget approach	Yes	No		No			
Poster	3_16	Bruce	Simpson						Yes		No	Yes		
Poster	3_17	Bob	Stewart	Johnstone River Catchment Management Association	Project Manager	jrcma@znet.net.au	Prioritisation of remedial action for Liverpool Creek, Far North Queensland		Yes		Yes	Yes		
Poster	3_18	Magdalena	Steffens	Environmental Ground, Water and Air Consultants Pty Ltd	Principal Consultant	msteffens@egc.com.au	Protection of Aquatic Environment - Utilisation of Groundwater Contamination Assessment in Design of Coastal Landfill Closure Options (Case study)		No		No			
Poster	3_19	Greg	Swain	Lloyd Consulting Environmental Project Manager	Environmental Engineer	tlloyd@powerup.com.au	Ecosystem-based Assessment and Management of Marine and Estuarine Systems at the QNI Yabulu Nickel Refinery, Townsville		Yes		Yes			
Poster	3_20	Peter	Turl	Citiwater		pct@townsville.qld.gov.au	Picnic Bay Membrane Bioreactors for Wastewater Treatment at Magnetic Island, Australia		Yes		Yes	Yes		
Poster	3_21	Marie	Vitelli	Dalrymple Landcare Commitee Inc	Landcare Coordinator	vitellm@dpi.qld.gov.au	Conservative grazing management in the Upper Burdekin Catchment improves land condition and water quality	Yes	Yes		Yes	Yes		
Poster	3_22	Warwick	Waters	Queensland, Department of Primary Industries	Senior Extension Officer (Irrigation, Dairy)	WatersW@prose.dpi.qld.gov.au	Benchmarking / Performance Evaluation as a participative management tool to achieve sustainability. (1630 - 1650)		Yes		No	Yes		
Poster	3_23	Allan	Williams	Australian Cotton Growers Research Association	Executive Officer	allanw@austarnet.com.au	Implementing Research to Protect the Environment—Experiences of the Cotton Industry		Yes		Yes	Yes		

Attachment 2

SUSTAINING OUR AQUATIC ENVIRONMENTS

-Implementing Solutions

Summary of "The Way Forward" Workshop

Compiled by: Noel Dawson, Diane Tarte, George Rayment and Nick Schofield

23 November 2001

January 2002

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National Conference: "Sustaining Our Aquatic Environments - Implementing Solutions"

Summary of "The Way Forward" Workshop

Townsville 20 -23 November 2001

Introduction

A key objective of the National Conference attended by around 200 delegates drawn internationally and from across Australia was to identify and develop some "Actions for the Future", based on the existing knowledge of participants and information and discussions at the conference.

To achieve this, participants initially worked in five groups on the final day to:

- Identify new or enhanced directions to achieve sustainability of Aquatic environments;
- Establish priority actions that individual sectors or partnerships can implement;
- Develop time-lines and pathways for implementation of the priority actions; and
- Identify Champions for the actions.

The five groups into which the participants were organised were based on sections of a catchment (upper catchment, lower catchment, coastal development, estuaries and reef and total catchment). However they were able to range across all areas in their discussions and reporting. The groups had approximately 1.5 hours for brainstorming issues and priority actions on butchers' paper and then developing Action sheets for their top five priorities (see Attachment 1 for details of these unedited sheets). The Chairs[1] of each group then reported to a plenary session on their top priority actions.

All participants were given two votes each and asked to allocate these to the actions they saw as priorities. This enabled the summaries of the priority actions identified by all the groups to be placed in priority order (see Attachment 2). The top five priorities were then discussed further in a plenary session. Due to time constraints not all present cast their votes.

The following summary of issues and actions is based on this discussion, together with an analysis of all the information presented. The Recommended Actions outlined below do not necessarily follow the priority order set by the voting as the work sheets and discussions identified some common themes for further action. For this reason there are no final priorities.

Two key issues that did arise right through the conference were *"the need for realistic engagement of land users in planning the implementation of projects and programs,* and *"the need for actions to increase the capacity (both human and economic) of land users to be involved in the planning and implementation of change".*

[1] Chairs were: Upper catchment = Ken Stallman ; Lower catchment = Allan Williams ; Coastal development = Jane Muller; Estuaries and reef = Brianna Casey; Total catchment = Simon Woodley .

Actions to addresses both these issues are scattered through most of the recommended actions. However, unless more emphasis and real commitment is given to these two issues we will continue to struggle to improve the sustainability of our aquatic ecosystems.

Summary of Recommended Actions from Workshop

From Attachment 1, the working groups identified a wide range of concerns and possible actions. Some were captured in their summaries but many important issues, that were discussed and listed by a number of groups, were not reported. Thus, in this final summary we have tried to reflect both the priority actions and the discussions of the working groups by using all the information including the discussion in the plenary sessions.

Most of the Recommended Actions will not be surprises. However, because the participants represented a wide cross-section of informed and active groups in resource management there is a need to take these seriously and try to move them forward.

Recommended Action 1: Whole of government review of Natural Resource Management (NRM) administrative and legislative arrangements.

Issue: There is widespread concern about the plethora of Commonwealth, State and Regional government programs and legislation in regard to sustainable resource use and management. Responsibilities are blurred even within jurisdictions and it is difficult for land-users and even government officials to keep abreast of legislation and requirements of them. There is considerable waste due to duplication of effort, poor "big picture" targeting of programs and point-scoring across jurisdictions. There is no agreed long-term vision of where we want to be as a Nation or how this might be achieved strategically.

Whilst the National Action Plan (NAP) initiative on salinity and water quality is seen as a move in the right direction, its implementation has been slowed by a lack of cooperation and definition of "territory". Most participants felt the time was right for an independent review of State, Commonwealth and Regional government responsibilities to simplify processes, develop cooperative arrangements and clearly identify responsibility for the stewardship of our natural resources.

Champions: State and Commonwealth Agencies and the Ministerial Council for NRM should be responsible for moving this forward.

Recommended Action 2: Increase National, State and Regional funding levels to NRM and focus this on developing "local" management arrangements that reflect the seriousness of resource degradation and the actions needed to achieve sustainability.

Issue: The National Land and Water Resources (NLWRA) Audit and other cooperative studies between Industry and Conservation groups have highlighted the need for new funding sources and arrangements to combat and repair degradation of our natural resources and guarantee the future sustainability of production and protection of significant areas. Whilst we see ongoing new initiatives from National and State Government, often they are short-term relative to the size and social complexity of the problem. Generally the resources needed to support these new initiatives are drawn from existing priority areas.

Rightly, significant emphasis is being placed on regions to lead actions to improve sustainability but they are generally poorly resourced and often lack capacity for managing complex programs. To achieve this there will need to be better targeting of action programs, engagement of those who will implement change, program planning and funding that

reflect the time it will take to implement programs and performance measures to enable adaptive management and guarantee performance and capacity building.

Targeting of NRM programs need to reflect the capacity of land-users to act, risk assessment based on good science and consultation, and the impacts of actions on downstream uses and environments.

Development of local and/or industry led partnership programs are more likely to share responsibility for problems and actions and achieve meaningful involvement and ownership by the community. A win /win outcome is more likely. The well funded Moreton Bay / Brisbane River experience was cited as a good example. However, both Commonwealth and State programs still seem unable to adequately support local / regional / industry programs. New funding sources need to consider new catchment / regional /local levies for works of public benefit.

Champions: In Queensland the LandCare and Catchment Management Council, peak Industry bodies and the Local Government Association of Queensland seem appropriate bodies to promote these initiatives to State Government and the NRM Ministerial Council.

Recommended Action 3: Increase the involvement of practitioners with relevant social and economic skills in planning and implementing action programs.

Issues: There was a strong feeling that current NRM action plans and R&D projects have limited input from people who have practical, social and economic skills to:

- Understand the blockages and drivers to the implementation of improved land use and management practices;
- Convert technical information into knowledge and develop ownership for actions;
- Identify and create awareness of the economic and social benefits of taking action;
- Use targeted communication processes that are appropriate for communities and those being required to make changes;
- Plan cultural change; and
- Remove the culture of blame and replace it with cooperative approaches.

Many felt that government and R&D programs do not lead to effective transfer of information to end users in a way that they can see the benefits to them in implementing changed practices. The sheer volume of messages being sent and a move away from extension services and other more personal approaches further complicates this.

The top priority recognised in the workshop (see Attachment 2) identified the need for greater use of targeted demonstration sites. However, this was only an example of many important elements recognised by the groups that could be used to extend practical solutions based on good science to the community as a whole. The use of social scientists in the planning of R&D and action plans can help build ownership and develop appropriate extension and communication approaches. Funding commitments are needed for these activities, as they also need resources to research clients and develop appropriate processes to involve clients in the planning and implementation phases.

Similarly economic assessment of the benefits of taking action needs to be incorporated into projects. Whilst this sounds like common sense the reality is that little effort is put into outlining the economic benefits and costs of actions to improve sustainability. An example of this was the difficulty that the NLWRA had in assembling data on the economic costs

and benefits of addressing land and water degradation, despite a concerted effort. This information is also needed to help develop cost sharing and compensation arrangements and evaluate the use of mechanisms such as structural adjustment, incentives etc. If a big picture approach is not taken then often real outcomes are not achieved.

There are already many groups making greater use of social and economic skills to speed adoption of R&D and plans, but their use in action planning projects aimed at improving land use and management is not widespread.

Champions: Research, Development and Extension (R, Dand E) organisations and planning groups.

Recommended Action 4: Government and Land-user organisations to continually identify and provide seed funding for well researched and innovative approaches to achieve sustainable use of natural resources.

Issues: When resource degradation issues are recognised a common first call for action is for legislation or enforcement action. Whilst legislation plays a legitimate role in setting standards and preventing unsustainable uses it is not particularly effective in changing practices or achieving best practice on a large scale. Sometimes regulation can even constrain initiatives that will lead to improved practices. Examples of this were given in David Wiskar's presentation on the EPA's Sustainable Industries Program.

Another suggestion from the groups was that performance auditing should be developed further to monitor the performance of projects and the achievement of best practice. This approach, now gaining acceptance can be used by individual land users, industries, catchment and regional groups, government and funding groups to evaluate performance and adapt management practice based on feedback from measuring change. It is also a useful learning tool.

Where Best Management Practice (BMP) is being used to evaluate performance or replace other compliance mechanism good auditing and reporting arrangements are needed. BMP has been used widely in manufacturing and processing industries but its current use in NRM could prove to be a valuable tool for achieving sustainable outcomes. It can be used to measure change in environmental, economic and social performance and to recognise and reward good performance.

However there are additional costs associated with achieving and accrediting BMP (and auditing) and the immediate benefits to producers are not always obvious. Suggestions for product labelling of quality product meeting BMP should be encouraged with consumers being educated in the benefits of paying a premium for these products where it is appropriate.

Champions: Industries, Government funding agencies and regional groups are appropriate groups to progress this recommendation.

Recommended Action 5: Performance Targets should be used as a means of ensuring that environmental / sustainability objectives are met.

Issues: Negotiated performance targets have been used for some time in business management to drive change but until recently these have not been applied consistently in

NRM. Where targets have been used it has often been difficult to measure changes and many have been viewed as having been imposed with little involvement of those who will be responsible for actually implementing the changes being sought.

The workshops identified targets as an important mechanism to achieve improvements in sustainable resource use. However they identified the following points as essential elements in the development of targets:

- Based on good science and information / knowledge;
- Focussed on sustainable thresholds;
- Developed in consultation with relevant interests but particularly "owned" by those who will be responsible for change at local and regional level;
- Avoid imposition where possible;
- Ensure adequate knowledge is available - including economic and social;
- Capacity / resources are available to support change;
- Agreement on auditing, monitoring and reporting processes to measure performance against targets; and
- Are achievable.

Where possible the implementation groups should be responsible for reporting on progress against targets. Regular independent auditing is valuable in maintaining credibility.

Champions: All organisations involved in improving sustainability or protection of environmental values should strive to develop bi-partisan support for this approach. In Queensland the LCMC should promote this approach in catchment management programs.

Recommended Action 6: Develop a critical awareness of the costs of inappropriate developments and individual actions and their impacts on community and personal values.

Issues: Research and detailed reports on the state of our natural resources such as the NLWR Audit have generated quality information on the state of our natural resources and unsustainable uses. Despite this the majority of the community seem unaware of the costs and impact of unsustainable resource use and management (particularly when it is not in their backyard). There is also a widespread concern that governments also support initiatives which, if the real long-term cost benefits were assessed, would not proceed.

As mentioned earlier some key reasons for this are:

- That we are not effective in turning information into knowledge that people can act on; and
- Information on the real costs of development and individual actions (particularly in regard to the long-term productivity and values of our natural resources) is very poor and the methodology for such assessments poorly developed.

Some critical areas where this was raised as a concern were:

- Removal of riparian vegetation;

- Removal of wetland functions;
- Land clearing and vegetation removal;
- Reduction in hydrological flow and connectivity;
- Introduction of weed species;
- Inefficient and inappropriate water use; and
- Increased sedimentation, nutrients and pesticides in aquatic environments.

There is a need for improved knowledge about the connectivity provided by aquatic environments and the impacts of changes at one end of a catchment on others in the estuaries. These impacts (social, economic and environmental) need to be quantified.

Champions: The work commenced by the NLWRA needs to be progressed to develop processes to assess the real cost of resource degradation and the costs of remedial measure to reinstate sustainable systems. The Commonwealth and States through the NRM Ministerial Council should address this issue.

Recommended Action 7: That Technical and R&D organisations and funding bodies consider the following issues identified in the workshops for enhancement of their programs.

Issues: The workshop concentrated on the implementation of science to achieve sustainability so this suggestion provides feedback on these aspects of R&D, not necessarily on the technical and R&D issues. Some of these have been covered in more detail in previous sections. Key points raised were:

- Need for development of cost effective / comparable monitoring systems which can be adapted to local use to benchmark performance and manage change;
- Greater emphasis on economic and social information in the development of R&D proposals particularly in regard to benefits and cost, communication of results and involving end-users in design;
- Improved targeting of R&D to support implementation of action plans;
- Funding agencies need to recognise that scientists need to be seen as part of the community and implementation process and have committed time available to provide information which can target actions and help interpret results;
- Increase focus on identifying the benefits and cost of preventing / ameliorating resource degradation associated with inappropriate use and management;
- Identify threshold values where uses become unsustainable;
- Improve land and water modelling capacity and forecasting to assist in "Risk Assessment";
- Develop a functional definition of a waterway; and
- Improve knowledge on the wider changes in landscapes and productive systems in response to management actions such as fire management, over-grazing, tree clearing, wetland loss etc.

Attachment 1

Workshop on "The Way Forward"

Flipchart Information from Groups

<u>Group 1: Upper Catchment</u> - Chair: Ken Stallman (Chair, Queensland LandCare and Catchment Management Council)

- Dept's to communicate (intra & inter dept.)
- Information sharing about different projects
- Analyse *why* people don't share information
- Communication: Extension to remain relevant to landholders
  Structure of Govt. Dept. currently set up between 3 depts.
- Need to look at power of Dept. of State Development
- Need cohesive, whole of Govt. view of ESD
- Community recognition that the systems we are dealing with are dynamic systems
- Monitoring: Ongoing
  What are we doing with it?
  What do we require?
  Common standards?
- Auditing
- Availability of information and results of monitoring to community
- Agree to definition of terms
- Fire management, tree thickening, tree clearing: Understanding
  Changes in the landscape in response to management actions
- Recognise local knowledge in monitoring
- Govt. responsibility to provide resources to provide small audits of state of area ie. relating targets to actions which can be taken on the ground to have beneficial effect.
- Where in the landscape do we do the work? (How do we answer this question?)
- Resourcing $$$ - is there the recognition and the commitment to resourcing?
- Information often fragmented – need integration of information and management programs in regions
- Need long term funding cycles
- Need structured information to support groups
- Need change in culture to commit to acting on the information to get change
- Engaging constituency

- Feeding back to community and industry
- Need extension officers in regional and rural areas
- Regional bodies need to coordinate the regional programs
- Recognise we have lots of knowledge already and need to look at the big picture and more forward
- Education in rural areas and creating a culture change
- Create a culture of learning
- What are the constraints that are stopping 'me' the grazier from making the changes?
- Need social science help to achieve the changes
- Win-win solutions
- Need to focus on underlying drivers not proximate causes
- Auditing the efficacy of voluntary measures and incentives prior to establishing regulatory regimes

PRIORITIES

Priority 1 – Engagement

Action:	Figure out how to engage the community to ensure ownership
	Practical examples – on the ground
	Build capacity to have pro-active change
Timing:	6 months
Champion:	CSIRO, New regional bodies, Industry & State Govt. & Conservation

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Priority - Capacity Building

Action:	create / provide structured information which is relevant and timely and work on a personal level
Timing:	ASAP
Champion:	New regional bodies, everyone has to take some responsibility

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Priority – Monitoring

Action:	Review current monitoring processes to make them coordinated and relevant
Timing:	Immediate
Champion:	State & C'wealth Govts.

Additional: Concerns that current monitoring review is inconsistent and patchy on a regional level

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Priority – Communication

Actions: Providing consistent natural resource terminology and protocols for communication and data management including face to face communication

Timing: ASAP – milestone – a compendium of terminology within 3 months

Champion: Local community and industry

Priority – Streamlining and integration of State, Federal and Local Govt. Agencies

Action: Review State and Local Govt. policies and processes to streamline and provide consistency in natural resource management

Timing: Ongoing – to be finished within 12 months

Champion: LCMC

Votes

Engagement	12
Communication	1
Streamlining State/Federal/Local Govt. Processes	4
Monitoring	2
Capacity Building	5

<u>Group 2: Lower Catchment</u> - Chair: Allan Williams (Australian Cotton Growers Research Association)

- Share responsibility for problems (cane farmer)
- Siltation – where coming from? Research needed before blame
- Aquatic weeds – effects
- Scientists should reflect science rather than personal views – needs to be understandable for people on the ground
- Father – families
- Adaptive management: Info gathering / dissemination
  Data in different formats
  Need process for this
- Participation in meaningful ways (by community) – local solutions – not from Canberra / big cities
- Term 'grassroots' not liked
- CSIRO research on nutrient run-off
  - 78% of air N (according to cane document)
  - N run-off measured from land / cane paddocks
  - How much comes from land and air?
  - 10 – 30 kg N depending on rainfall
  - People don't understand N cycle
  - Scientists communication with farmers
- Environmental Education
  - Understanding of basic ecology needed to interpret results
  - Scientists need to be part of community
- Adoption of projects (reveg of creeks)
- Artificial wetlands needed
- Technology uptake
- Promotion of education of the work of Cane Production Boards
- Sediments, Nutrients (fishing (commercial))
- Changed forces on fisheries – results are benefits, increased productivity, time-frame (initially resisted change, but recognise benefits once change made)
- Strengthen partnership between primary providers / funders – impute to change through time / on-farm changes.
- Ag people talking to gov't / scientists
- Objective info on problems / severity / solutions are working?
- Codify / intensification of land use – minimum standards to demonstrate sustainability

- Works to change hydrol. And change to fisheries
  - Ability to discharge sed load changed (dams)
  - Effects of sed on rivers
  - Industries, gov't needs to be more effective
- Fisheries is being effected by changes to connectivity and hydrology (floods)
- We have technical info but people are still not aware / understanding tech. Jargon – need to get message across jargon-free
- Politicians only interested in good news and things that affect their term
- Not enough rotational cropping (eg. Legumes, decreased urea use)
- Over-cultivation (eg. Min. till, overtrafficiy)
- Green cane cutting – burning cane – air quality problems
- WQ – N loss from land, sediment loss, erosion: need smart solutions for increased productivity
- Decrease in funds reduces ability to implement smart solutions
- Objective info needed, quantitative science is subjective – need to involve all stakeholders to keep science objective
- Meaningful change (institutional) eg. Planning arrangement – trade-offs, funding, set targets, monitor progress
- Science – community linkages (education, mutual learning, respect)
- Jargon on BOTH sides (eg. Nitrate, words need to be used – not jargon)
- Productive systems in floodplains – how is this possible? Must be achieved!
- Categorisation / polarisation of scientists, community, farmers
  - Achieve viable sustainability – is the common goal
  - Sustainability – legislation creates it but not through cooperation from community (not true sustainability)
- Farmers are always blamed for:
  - Barrages make problems with water quality
  - Smoke also comes from wildfires / tree burning
  - Water quality also affected by sewage
- NAP – regional body to direct funding / mediation (outside gov't)
- GIS centre with all stakeholders
- Changed farm practices
- Community participation
- Water quality
- Target setting
- Structural changes (physical, barrages, roads)
- Information collection, integration, dissemination

PRIORITIES

1. Get people together (including existing groups) into a community forum to discuss solutions (eg. Farm practices possible with no levees…) Herbert, Vince (driven by fishing, farming communities) Could include other catchments, also to include Natural Resource Boards (NAPII) – Developing vision of future
    - Get better at regional planning involving general community and scientists to debate the issue, better general understanding, targeting, prioritization of causes
2. On-ground works – demonstration sites for implementing solutions on-farm developed in conjunction with landholders – best practice management.
    - Translation of scientific info into practice (educational program)
    - Includes monitoring
    - Includes paddock-level goal setting
3. Development of compensation plan, EPA, DPI, QFF
4. Removal of structures that affect floodplain & industries etc. (recognise past mistakes and benefits)
5. Codification of practices into planning scheme – take account of the bigger picture in terms of targets
6. Agreed use COMPASS as auditing tool for sugar farms
7. Revegetate riparian areas of entire Burdekin River in 5 years
8. Change laws to allow effective measures to control hymenachne, weeds, viruses, pigs

<u>Group 3: Coastal Development Zone</u> Chair - Jane Muller (Queensland Fruit and Vegetable Growers)

1. Provide info to broader community – develop a critical mass of interest – every river basin must have community info resource centres
2. Set limits to growth / intensification of development (thresholds)
3. Ensure catchment plans pick up coastal zone targets
4. Articulation of environ values - $$ economic paradigm eg. constenza wants – incl. Costs, triple bottom line (catchment groups need to articulate the values of their catchment's resource – in economic terms if necessary)
5. Critical mass awareness – relate environmental costs of development patterns / individual actions
    - Regulatory level
    - Promotion via industry / corporate leadership
6. Relate environmental management needs to range of personal values community do identify with – ie. fishing, recreation etc.
7. Protective management – be pro-active in maintaining near-pristine areas – Sunfish to ID critical estuaries
8. ID values of coastal zone to feed into planning that can recognise constraints to maintenance of values limits to acceptable inputs
9. Land exchanges Crown land of low environmental value – developers that have high value land
10. Coordination and resourcing monitoring activity – coastal zone – planning and policy create promises – people deliver outputs (ID whose' responsible for action, resourcing of plan implementation)
11. Review planning legislation capacity to serve ESD / NRM eg. IPA limitations
12. Inventory of coastal zone resources – esp. wetlands and sensitive environmental resources
13. Resourcing local authorities to deliver environmental management
14. Increase recognition of linkages: upper catchment – coastal zone – esp upper catchment stakeholders
15. Resourcing external organisations eg. Sunfish etc. to be more effective in campaigning / resource documentation 'fish kissing levy'
16. Restoration / rehabilitation key coastal zone environments ie. wetlands and functions ie. catchment detention, tidal flushing, bund walls etc.
17. Political Interference – need to disconnect from community initiatives – allowing good programs to run over a long enough timeframe
18. 'Fix-up' ensures appropriate management for high value resources ie. RAMSAR wetlands
19. From compo to coast sharing across all stakeholders

PRIORITIES – TOP 5

1. Hands on – putting back the function (remedial) – protecting what's in good condition
2. Resources for information to support decision making – transferability
3. Resourcing & shifting power to allow local govt. and community based plans to manage & implement plans
4. Awareness and responsibility – get the people involved and politicians on—board – influence people politically…
5. Inventory / Benchmarking / Monitoring / Modelling

<u>Group 4: Estuaries / Reef</u> Chair - Brianna Casey (Queensland Farmers Federation)

- Legislative review driven by sustainability imperatives – Env Ombudsman
- Develop Head of Power for Env. Management – Commission for Sustainable Development
- Govt. Dept. / Agencies – need to talk!
- Statutory recognition of WH – Beattie Commitment
- Implementation / enforcement of legislation (3rd party rights)
- Riparian Vegetation:
    - Remove / change
    - Need to stabilise estuarial inputs
    - Point source
    - Barrages
- Barrages
    - Dams / weirs
    - Removal not only option
    - Design – structural / ecological eg. fish ladders… do they work in Australia (Lazy Fish!)
    - Light penetration
    - LOCAL GOVERNMENT ISSUE
- Definition of a waterway
    - Inconsistent advice from Departments
    - Legislative inconsistencies
    - Functional definition required
    - Site specific – power within ICM
- Holding tanks on boats
    - Legislative issue – how do we address smaller issues?
    - Ballast water – sea lanes 550m – 2km from reef
- Critical nursery areas
    - Protect important areas
    - River trust
    - Good work happening in Rocky – need more
    - Fish ‘habitat’ / fish ‘nursery’
    - Recreational / commercial
- Department ‘Deaf Ears’
- Sustainability
    - Alternative approach

- Interdepartmental 'sustainability' group
- State development can over-ride – equivalent Act for Sustainability
- WA Premiers Department example
- What do we want?

- 3rd Party Rights to 'keep the bastards honest'
- Commission for Sustainable Development
  - eg. Victorian Commission for ESD
  - Report on achievement – ESD
  - Reporting through EPBC
- EPA doesn't have legislative teeth
- Existing legislation structure is a barrier to achieving ESD
- GBR recognised federally as a WHA
  - How do we factor in WH values at State Level
  - Tourism / fishing / primary production / social
- INCENTIVES – and the 'C' word
- Litigation – can it move things forward?
  - Legislation must be properly democratic
  - Common law may drive it, specialist court?
- Coastal Industrial Landfills
  - DDT, not regulated by licensing
  - Herbicides, pesticides etc.
  - WATER QUALITY
  - Different attitudes between states
  - Synthesising issues – must be able to modify over time and flexible
  - Monitoring – EPA -?
- More stringent guidelines for all users
  - Minimum standards
  - Not better numbers, but how to apply them
- We are 'Meeting'd out!
  - How many times do we have to re-invent the wheel before we attach it to a vehicle?
- Risk Assessment
  - Which issues are 'sexy' from week to week? Priorities?
- Viability
  - Consumers / residents / tourists not prepared to pay more for sustainability
  - Who Pays?

  - Eco-tourism – standard accreditation?
  - Consumer awareness campaign
- Australian Risk Management Standard
  - Bi-partisan support
  - Opportunities
  - WQ on the Agenda
- Factor in env. Outcomes into existing support programs – cross compliance, structural adjustment – effort reduction in GBR catchment
- Regulation – can be much more targeted through risk framework
- Education & Awareness

PRIORITIES

1. Legislation (cross compliance / structural adjustment)
2. Riparian Vegetation (weeds management / enforcement of existing / incentive scheme / compensation)
3. Def'n of a Waterway (EPA Atlas of Fresh & Brackish wetlands end of financial year)
4. Making regional planning more effective (as above 01/02)
5. Education & awareness [industry support programs (LCMC Industry Govt.), Coastal Protection & Management Act (EPA)]

<u>Group 5: Total Catchment</u> - Chair: Simon Woodley (S&J Woodley Pty Ltd)

- Developing partnership and ownership
- Improved communication scientists, managers & community (scientists need to be 'closer' to managers)
- Follow through on existing plans, processes and strategies, with implementation & auditing (eg. House of Reps standing committee on public good conservation)
- Support existing frameworks esp. funding & industry int.
- Establish Regional Bodies for NRM
    - EBM
    - Autonomous
    - Stat based
    - Capacity to raise own financial resources (SA Catchment Management Bodies)
- Commitment to priortise 'Alternative' water supply
    - Water use efficiency
    - Water recycling
    - Rain water tanks
    - Allocation!
    - Over and above less sustainable options
- Resourcing community waterways stewardship & education
    - Evaluation of ecosystem resources & services
- Integrate planning inst. Between govt. departments and within
- Make public aware of outcomes of this conference. – esp. local government
- Improve Land & Water modelling capacity & forecasting – esp. social & economic aspects
- Immediate removal of orphan weirs
- Consolidate existing information and risk assessment to set priorities
    - Case studies that work
    - Implementation of ESD
- Improved and increased community involvement in town planning – whole of council planning
- Water 'allocation' property rights
    - Water allocation – what is it?
    - Who receives it?
    - Ecosystem or people
    - Fair & reasonable

Issues

- Resources

- Capacity / practitioners / community / long term commitment

- Rec. of T.O Estates
- Community based forums
- Define a list, cap, reduce offensive products
- Establishment of agreed targets for ICM
  - 'Cleve' targets
  - Relevant to local people
  - Strategic, long and short term
  - Analysis & reporting – feedback incl. Socio-economic
- Whole of ecosystem, community engagement
- Improve public awareness – market research
- Whole of community stewardship (define stewardship roles – incentives)
- Work with EPA Sustainable Industries
  - On the ground implementation of case studies
  - Money to implement
  - Publicise it more
  - Communication

PRIORITIES

Priority 1 – Targets

Who: NRM Regional Bodies (NB. To be established in WA and NT)
When: 1 year (to establish targets)
Champion: John Olsen

Priority 2 – Inclusive Regional Bodies (to build on existing)

Who: NRM Ministerial Council (State & Federal)
When: 1 year
Champions: Ken Stallman / Barbara Wilden
Additional: where are no bodies – establish, where there are bodies – improve
Include scientists

Priority – Partnerships

Action:	Govt to improve internal process for equal partnership in NRM
	Establish inclusive regional bodies for NRM (autonomous, stat based)
Who:	NRM Ministerial Council / H.O.G. / Industry, Conservation, Community Peak Bodies, Scientists
When:	1 year (complete in 5)
Champion:	Allen Dale

Priority – Resourcing Community 'Stewardship' in the Long Term

Who:	AFFA, EA: Commonwealth Level
	NRM Council: Stage Level
	Regional Bodies
	Within & across
When:	NOW
Champion:	Brianna Casey

Additional Priorities / Surprises!

- Socio – economic issues (understanding human systems & decision making processes)
- Political processes

- Taking theory and translating to the practice – demonstration site helps that
- 'Farmers aren't dumb – if it works – they'll do it'
- Promote successes widely – CELEBRATE
- Don't forget other activities (non-farm)
- Keyword is 'sustainable targets'
- Targets must be:
  - Based on good science
  - Be consulted, to ensure ownership
  - Be location specific
  - Together with timelines
  - Achievable
- Engagement is critical, and targets just monitor progress
- Need practice & information targets
- Must engage all the community – no good preaching to the converted
- There are social scientists out there – but we don't use them enough
- Need adaptive, flexible, institutional processes
- Use science to offer options and to provide a context
- River mouth targets are set on basis of ecology of GBR (science is rough), then negotiate up into the catchment, on how to achieve targets at river mouth
- The top-down route of target setting disempowers the community
- Must adequately resource community stewardship initiatives
- No good just asking for $$ - must emphasise cultural change re N.R.M.

Attachment 2

Workshop on "The Way Forward"

Sustaining Our Aquatic Environments - Implementing Solutions Conference

Priority Action Sheets from 5 Groups in order of votes (not edited)

Priority: 1 *(20 votes)*

Action: *Demonstration sites of on farm solutions developed in conjunction with landholders to translate scientific info into practical advice and BMP. To include monitoring and paddock level goal setting.*

Timing: -

Champion: Extension providers (BSES, DPI, DNR, and Landholders)

Additional comments: Agreement of interest groups to use COMPASS and Industry programs to evaluate performance. Revegetate riparian zone of riparian zone of entire Burdekin catchment in 5 years.

Priority: 2 *(17 votes)*

Action: *Establish agreed targets in association with local people (clever, relevant to local people, strategic in the short and long term, with analysis and feedback reporting.*

Timing: 1 year

Champion: John Olsen

Additional Comments: NRM regional bodies

Priority: 3 *(12 votes)*

Action: *Resourcing Community stewardship in the long term (define stewardship roles, provide incentives, resourcing for education and provide rewards.*

Timing: NOW

Champion: Brianna Casey

Additional Comments: Aimed at AFFA, EA (Commonwealth), NRM Council (State) and Regional Bodies (Local)

Priority: 4 *(11 votes)*

Action: *Figure out how to engage the community to ensure ownership (Engagement).*

Timing: ASAP - 6 months.

Champion: CSIRO, New Regional Bodies, State Govt, and Conservation Groups.

Additional Comments: -

Priority: 5 *(9 votes)*

Action: *Review of sustainability legislation, develop head of powers for environmental management, government departments need to talk, cross compliance.*

Timing: ASAP

Champion: Environmental Ombudsman

Priority: 6 *(8 votes)*

Action: *Management NOW (Protective- high value areas, remedial- putting function back into coastal zone and catchments.*

Timing: Now

Champion: High profile community members

Additional Comments: Carry block of votes.

Priority: 7 *(7 votes)*

Action: *Empowering community/ catchment/ regional groups and organisations to be the "new" institutional framework.*

Timing: NHT / NAP associated timing.

Champion: Regional strategy groups.

Additional Comments: -

Priority: 8 *(6 votes)*

Action*: Improve partnerships between and within government, industry and community (better internal government processes, provide technical backing. Expertise, resources to*

build community capacity to implement NRM - eg soil conservation technical support, define stewardship roles and provide incentives and rewards for good stewardship.

Timing: 1 year complete within 5 years

Champion: Alan Dale

Additional Comments: NRM Council, Heads of Government.

Priority: 9 *(5 votes)*

Action: *Removal of structure that affect floodplains and industries (eg weirs, barrages and low-level bridges).*

Timing: -

Champion: Govt and local community.

Additional Comments: -

Priority: 10 *(4 votes)*

Action*:* *Streamlining and integration of State, Federal and Local Govt agencies (Review State, Fed, and Local Govt policies and processes to streamline and provide consistency in NRM.*

Timing: To be finished in 1 year.

Champion: Land care and Catchment Management Council

Additional Comments: -

Priority: 11 *(4 votes**)***

Action: *Development of compensation packages for affected landholders.*

Timing: -

Champion: QFF / Govt

Additional Comments: -

Priority: 12 *(3 votes)*

Action*:* *Review current monitoring processes to make them coordinated and relevant.*

Timing: Immediate.

Champion: State and Commonwealth Govt.

Additional Comments: Concerns that current monitoring review is patchy and inconsistent.

Priority: 13 *(3 votes)*

Action: *Getting the people together who are directly involved in the issue eg fishing and farming communities; process should also be driven by them. Also codification of practices at the regional level (industry, catchment)*

Timing: -

Champion: -

Additional Comments: Involve scientists and the community, Need to involve Natural Resources Boards (NAP), need a vision, Improved regional planning.

Priority: 14 *(3 votes)*

Action*: Improve Riparian Vegetation through Incentive schemes / compensation, weed removal, enforcement of existing vegetation.*

Timing: ASAP

Champion: DNR

Additional Comments: -

Priority: 15 *(2 votes)*

Action: *Targeted / cost effective inventory, benchmarking, monitoring and modelling; targeted key drivers of impacts; and serving management needs.*

Timing: 5 years.

Champion: National Land and Water Resources Audit

Additional Comments: -

Priority: 16 *(2 votes)*

Action: *Establish natural resource information centres and delivery in each region / basin.*

Timing: 2 years

Champion: LandCare and Catchment Associations in conjunction with LGAQ

Additional Comments: -

Priority: 17 *(2 votes)*

Action: *Improve education and awareness through Industry support programs, promote existing knowledge and focus on kids.*

Timing: -

Champion: LandCare and Catchment Management Council and Govt.

Additional Comments: -

Priority: 18 *(2 votes)*

Action: *Make regional planning more effective.*

Timing: 30.6.2002

Champion: Premiers Dept.

Additional Comments: -

Priority: 19 *(2 votes)*

Action: *Establish / Improve Inclusive Regional bodies that are statutory based, autonomous and have capacity to raise funds.*

Timing: 1 year

Champion: Ken Stallman / Barbara Wilden

Additional Comments: Include scientists for better communication. NRM Ministerial Council.

Priority: 20 *(1 vote)*

Action: *Build capacity by creation and provision of relevant and timely information and work on a personal level.*

Timing: ASAP

Champion: New Regional bodies

Additional Comments: Everyone has to take some responsibility.

Priority: 21 *(1 vote)*

Action: *Generating "critical mass " of community awareness regarding NRM and Coastal Zone issues.*

Timing: 10 years

Champion: Celebrities, High profile people.

Additional Comments: -

Priority: 22 *(1 vote)*

Action: *Definition of waterway through published atlas of freshwater and brackish areas and preparation of functional definition.*

Timing: June 2002

Champion: EPA

Additional Comments: -

Priority: 23 *(0 votes)*

Action: *Change laws as required to allow effective measures to control pests.*

Timing: -

Champion: Shire Councils / QFF / Farmers groups.

Additional Comments: -

Priority: 24 (0 votes)

Action: *Provide consistent natural resource terminology and protocols for communication and data management including face to face communication.*

Timing: ASAP - milestone - terminology needs to be developed within 3 months.

Champion: Local Community and Industry.

Additional Comments: -