HEALTHY COUNTRY, HEALTHY REEF

Rainforest CRC

cRc Reef Research Centre

JOINT CONFERENCE
23-25 November 2004
Cairns International Hotel, Abbott Street, Cairns

Established and supported under the Australian Cooperative Research Centres Program

CRC AUSTRALIA

CRC Reef Research Centre is a joint venture between the Association of Marine Park Tourism Operators, Australian Institute of Marine Science, Great Barrier Reef Marine Park Authority, Great Barrier Reef Research Foundation, James Cook University, Queensland Department of Primary Industries and Fisheries, Queensland Seafood Industry Association and Sunfish Queensland Inc. The University of Queensland is an associate member. It was established and is supported under Australia's Cooperative Research Centres Program.

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Rainforest CRC

The Cooperative Research Centre for Tropical Rainforest Ecology and Management (Rainforest CRC) is a research partnership involving the Commonwealth and Queensland State Governments, the Wet Tropics Management Authority, the tourism industry, Aboriginal groups, the CSIRO, James Cook University, Griffith University and The University of Queensland.

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KEYNOTE SPEAKERS

COUNCILLOR MIKE BERWICK
Mayor, Douglas Shire Council

Mike Berwick was born in Dublin, spent his early childhood in East Africa, finished his schooling in Australia and graduated with a science degree from The University of Queensland in 1973. In the early 1980s he became an activist in the conservation movement to save the Daintree from subdivision, to halt logging in the rainforest and push for the listing of the Wet Tropics as a World Heritage Area. For six years until 1991, Mike and his partner Jane owned and ran the Port Douglas and Mossman Gazette, at which time Mike stood for Mayor. He is now serving his fifth term.

Mike's concern for the environment, and interest in economically, ecologically and socially sustainable natural resource management continues to the present day. He is the Chair of both the Australian Tropical Forest Institute based at James Cook University, and the North Queensland Natural Resource Management Board (FNQ NRM Ltd). He is also a member of the Sugar Industry Guidance Group, the Queensland Government's Vegetation Management Advisory Committee, and the Author of the National Local Government Biodiversity Strategy.

The Douglas Shire is recognised for its achievements in environmental management and biodiversity conservation, winning the Banksia Award last year. Its work in developing ecologically sustainable agricultural systems, and its partnerships with scientific organisations such as the CSIRO, are also well known. The Shire's planning scheme was the first in Australia to set development limits, a concept initially greeted with shock and one that was not popular with the Shire's residents.

Mike and Jane run a small farm on the Daintree River growing Barramundi and purple mangosteens.

PROFESSOR RICHARD PEARSON
Head of School, School of Tropical Biology, James Cook University
Program Leader, Catchment to Reef Joint Program

Richard Pearson is Professor of Zoology and Tropical Ecology, and Head of the School of Tropical Biology at James Cook University. Until recently he was Director of the Australian Centre for Tropical Freshwater Research, based at James Cook University, a position he held for around ten years. He has worked as an ecologist in Townsville for nearly thirty years, and regards the region as the best in the world for studying ecology because of the richness of the biota, and the safe environment – marginally better than his native Yorkshire.

Richard's special interest is river ecology and his research has focussed on explaining why local tropical streams have such high diversity – at least equalling any in the world – and how human impacts on this diversity can be ameliorated. Richard has been investigating how agricultural run-off affects stream ecology. He was one of the founding scientists for the original CRC for Tropical Rainforest Ecology and Management, leading biodiversity projects on fresh waters and on terrestrial vertebrates. The first of these has evolved into the new Catchment to Reef Joint Program between Rainforest CRC and CRC Reef, while the latter became the continuing project led by Dr Steve Williams.

Richard is a keen proponent of both discovery science and science transfer, through formal educational processes and through scientific advice to government and community bodies.

DR DAVID WESTCOTT
Group Leader Ecology and Conservation, CSIRO Sustainable Ecosystems
Program Leader, Conservation Principles and Management

David Westcott is an ecologist and behavioural ecologist. He has spent his research career working on birds, almost entirely in the tropics. He cannot think of a finer place to work than a rainforest. David obtained a Bachelor of Science in Zoology from the Australian National University. After working briefly in Papua New Guinea, he moved to Canada where he spent the coldest summer of his life working on song sparrows. He subsequently completed a Master of Science and later a PhD at the University of British Columbia in Vancouver. This worked explored the evolution of lek mating systems in the Neotropical frugivorous flycatcher. Upon completion of his PhD, David took up a position with CSIRO Wildlife and Ecology (now Sustainable Ecosystems) as a rainforest vertebrate ecologist. Since then he has worked on the communication systems in rainforest birds, the ecology and management of the endangered cassowary, and on seed dispersal and frugivory questions.

DR CARLA CATTERALL
Associate Professor (Ecology), Griffith University
Program Leader, Restoration Ecology and Farm Forestry

Carla Catterall is a wildlife ecologist based at Griffith University's Faculty of Environmental Sciences, where she teaches natural history, ecological principles and methods, and their application to environmental and planning issues. Her research, with colleagues and students, aims to improve our understanding of the way in which wildlife respond to alterations in the quality and quantity of their habitat, and how fauna and flora in their full variety can be sustained in landscapes used by people. Carla has also been active in communicating information about ecological issues and land management to the general public. Her work has included discovering and communicating the effects of urbanisation and pastoral land uses. She has a particular fondness for birds as ecological indicators and flagships.

Since 1999 Carla has been leader of the Restoration Ecology and Farm Forestry Program of the Rainforest CRC. This program is shedding new light on reforestation techniques, motivating factors, and biodiversity outcomes in tropical and subtropical Australian rainforest landscapes. It has engaged both researchers and practitioners in the issue of how, where, what, why, and with what costs and benefits, can reforestation be achieved?

CONFERENCE OVERVIEW

Two main components will form the Healthy Country, Healthy Reef Conference:

RAINFOREST TO REEF RESEARCH:
Practical Solutions for Critical Environmental Issues

The 2004 combined Conference will bring together research providers and users from the joint *Catchment to Reef* initiative between Rainforest CRC and CRC Reef. The *Catchment to Reef* program is developing new tools to assess and monitor the health of catchments and aquatic systems in the Wet Tropics and Great Barrier Reef World Heritage Areas. These tools will enable land managers and stakeholders to improve the quality of water flowing into the Great Barrier Reef lagoon.

Researchers from the *Catchment to Reef* program and other organisations have developed beneficial working relationships with farmers in the Wet Tropics region. The *Rainforest to Reef Research* component of the Conference will showcase some of these cooperative approaches and the solutions they have generated for farmers and for the environment.

- **Presentations** will outline practical solutions to on-farm water quality issues.
- **Workshops** will provide an opportunity to learn from the experiences of others, and to contribute your own.
- A **field day**, to be held on 24 November concurrently with the start of the Rainforest CRC Annual Conference *Tropical Futures*, will provide an opportunity to visit properties where practical methods have been used to improve water quality. Farmers and land managers are invited to participate.

TROPICAL FUTURES

The 11th Annual Conference of the Rainforest CRC will take the form of 'community forums', or workshops. Three main sessions will be held across two days. A number of speakers representing different sectors will participate in each forum and will present new scientific data or provide stakeholder comments. At the end of each set of presentations, a moderated panel session will follow to allow audience interaction and discussion.

Community Forum 1
Threats to Landscape Integrity and Ecosystem Resilience

Tropical landscapes are facing a period of rapid change through urbanisation, climate change and other threats. The urban and peri-urban areas on the east coast such as in the northern cities of Cairns and Townsville, and southern areas such as the Sunshine Coast, Gold Coast and Northern Rivers, are facing a 'sea change' as their populations increase. In areas such as the Atherton Tablelands the decline of some rural industries threatens the very landscape and rural or semi-rural life-styles that many people moving there are seeking. How can science help to maintain productive rural landscapes and reduce the impacts of urbanisation? Is this not an opportunity as well to reforest large areas in ways that will provide economic and biodiversity benefits?

This session will provide an opportunity to present new Rainforest CRC information on some of these threats and to provide new frameworks for monitoring impacts, conservation frameworks, revegetation and farm forestry.

Community Forum 2
Integrating Scientific Research, Conservation Planning and the Community

This session will expand on the science and state of knowledge presented in Community Forum 1, by attempting to integrate scientific research, conservation planning and the wider community. Those expressing an interest in conservation of biodiversity include government agencies, landholders, Aboriginal groups, tourism industry, primary industries, scientists and other researchers, community groups, local residents, visitors, Australians and the world.

Themes to be discussed by a diverse panel of speakers include:

- The role of science and research in biodiversity conservation
- Conflicts between biodiversity research and other community values
- Interactions between stakeholders and researchers
- Planning for conservation management, specifically how do planners and land managers integrate the needs of biodiversity conservation and community sectors in conservation management?
- Examples of different levels of planning incorporated into scientific research
- Balancing the needs of biodiversity conservation, research and community
- Allocation of scarce funding for biodiversity conservation

Community Forum 3
Tropical Futures – Where do we go from here?

The experiment with environmental Cooperative Research Centres has provided many new methods of delivering research and outcomes to stakeholders. It is now clear that both sides of Government are committed to the continuation of this work, so what should replace the Rainforest CRC after June 2006? What are the major challenges and issues the Rainforest CRC, or its replacement organisation, should be addressing in the future? How can we improve the delivery of science for on-ground action and to decision and policy makers?

Are scientists communicating well with communities? There are significant differences in the way that scientists engage with and talk about environmental processes and the manner in which the community experiences and understands these things. For some time now, scientists have asserted that they have important insights to offer the community when it comes to the issues of sustainable environments and sustainable communities. How can we move beyond these assertions and examine both the barriers to and breakthroughs in communicating these insights?

Community Forum 3 will engage a number of key speakers who will provide some provocative ideas that we hope will form the basis of discussions to build a new research organisation that delivers outcomes for tropical Australia and our near neighbours.

GENERAL INFORMATION

PARKING

Valet parking is available at a cost of $6.00 per day at the Cairns International Hotel. Alternatives include parking in parking metre spaces in Cairns City (remember to check your parking metres during the day!). Parking is also available at The Pier Marketplace for around the same cost as metre spaces.

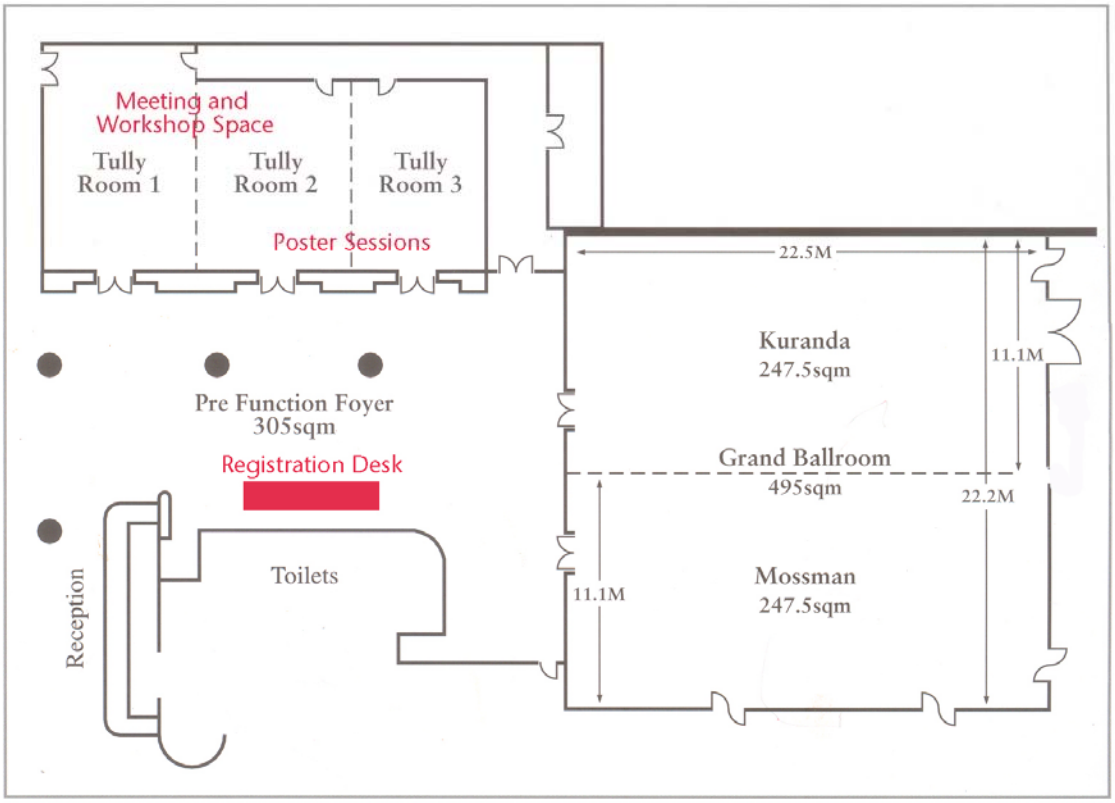
REGISTRATION

Those delegates who will be attending the Welcome Reception on Monday evening may complete their registration at the Reception on Level 3 of the Hotel (pool and function area).

For the remainder of the conference, the Registration Desk will be located in the foyer outside the Grand Ballroom. There will be a noticeboard located nearby for Conference notices, messages for delegates and media releases.

The Registration Desk will be attended at the following times:

Monday, 22 November (on Level 3)	5.30pm to 7.00pm
Tuesday, 23 November (in Hotel Foyer)	7.30am to 6.00pm
Wednesday, 24 November (in Hotel Foyer)	7.30am to 6.00pm
Thursday, 25 November (in Hotel Foyer)	8.00am to 4.00pm



GROUND FLOOR BALLROOM AND MEETING ROOMS

POSTER SESSIONS

Two Poster Sessions will be held as part of the Healthy Country, Healthy Reef Conference. Both sessions will be held in Tully Rooms 2 and 3. Please feel free to either leave posters with staff on the Registration Desk or place them on the poster boards provided in Tully Rooms 2 and 3. Presenters are requested to stand alongside their posters during their preferred Poster Session (as per Registration Options on your completed Registration Forms) to answer queries from and chat with interested delegates and members of the community. See the Social Program for further information. Poster Sessions provide an excellent opportunity to share knowledge and interact with a wide audience.

STUDENT POSTER COMPETITION

Students who have registered a poster have the chance to receive one of three prizes for best poster presentations (NB. The competition is open only to students who are currently registered with the Rainforest CRC or CRC Reef Research Centre).

First prize will be a cash payment of $500.00, with two runner-up prizes of $250.00 each.

Student posters from both Poster Sessions will be included in assessment of the Competition, and the winners will be announced during the luncheon break on Thursday, 25 November. Winners will also be notified by email after the Conference.

A Panel of three judges will assess student posters against the following criteria:

- ✓ A poster that is engaging and inspires the audience to want to know more;
- ✓ Well organised information;
- ✓ Clarity, brevity and relevance;
- ✓ Suitable acknowledgement of the Rainforest CRC or CRC Reef, funding bodies and other assistance; and
- ✓ Evidence that the student understands the significance of their research in relation to their CRC's key research objectives.

This year, we welcome our Panel of Judges for the Student Poster Competition, and extend our thanks for participating:

Professor Julian Cribb, Julian Cribb and Associates
Ms Karen Benn, Environmental Protection Agency
Dr David McJannet, CSIRO Sustainable Ecosystems

AUDIOVISUAL EQUIPMENT

Delegates are requested to provide their presentation to the Registration Desk as soon as they can to ensure smooth time keeping during the three days (and to avoid those awkward moments when things just don't go according to plan!).

Presentations will be given in the Grand Ballroom. The following facilities will be available for delegates' use:

- Laptop, data projector and 12ft x 9ft draped screen;
- Overhead projector with smaller screen on tripod stand;
- Lectern with microphone and electronic whiteboards.

Whiteboards and data projectors will be available for delegates of Day One who are involved in the Workshops.

MEDIA LIAISON

Ms Pip Miller, the Rainforest CRC's media consultant, has kindly offered to provide media services this year. Pip will be coordinating daily media releases and meet and greet journalists and news crews. Pip will also organise interviews with researchers and presenters.

The Rainforest CRC will host a special guest at this year's Conference, Professor Julian Cribb, a well known and highly successful Australian science writer.

SECRETARIAL SERVICES AND STORAGE

The Cairns International Hotel has a Business Centre available 24 hours a day for use by Conference delegates. Charges do apply for internet, email, photocopies, etc. Delegates should enquire at the Hotel's Reception.

Storage of luggage, displays and other items will be available, and delegates should contact the staff of the Registration Desk for further details and instructions.

WHO TO CONTACT DURING THE CONFERENCE

Conference Secretariat	Ms Shannon Hogan Ms Birgit Kuehn
Registration Desk (and General Enquiries)	Ms Trish O'Reilly
Workshops	Mr Tim Prior
Media Liaison	Ms Pip Miller
Audiovisual Equipment	Ms Shannon Hogan *Stageworks* Representative
Poster Placement	Ms Diane Grogan
Conference and Dinner Arrangements	Ms Shannon Hogan

Mmmm, MEAL BREAKS!

Coffee, tea and herbal teas will be offered each morning before commencing the day to ensure everyone receives their caffeine fix.

Morning and Afternoon Teas will be provided for all delegates during the Conference and will be served in the foyer outside the Grand Ballroom. Times for tea breaks will differ each day, so it's best to check your Program each day.

A buffet lunch will be served in the function area on Level 3 to delegates each day of the Conference. The Hotel is preparing some wonderful dishes, suitable for all. Please provide your lunch voucher (provided at Registration Desk) to Secretariat staff each lunch break when requested.

Those delegates who have registered specific dietary requirements will be catered for. If you have any specific requirements that we are not aware of, please don't hesitate to contact the Registration Desk.

ACKNOWLEDGEMENTS

The Catchment to Reef Field Day is sponsored by FNQ NRM Ltd, the designated body representing community-based Natural Resource Management in the Wet Tropics. The Conference Secretariat wishes to thank FNQ NRM Ltd for their valued support.

We wish to thank the following people for their time and assistance in preparing for this year's Joint Conference:

Mr Tim Prior, for coordinating events for Day One and the Field Day and responding to urgent requests with humour and enthusiasm!

Professor Julian Cribb, Ms Karen Benn and Dr David McJannet, our Judges for the Student Poster Competition.

Ms Pip Miller, who provides a very professional media liaison service to the Rainforest CRC, for coordinating advertising, media alerts and science stories as part of the Joint Conference.

Ms Leigh Nancarrow, of Cairns International Hotel, for her prompt and professional assistance in finalising arrangements for the Joint Conference.

Ms Sally Bushnell, Ms Kylie Goodall, Ms Kim Hauselberger, Mr James Hill, Ms Tina Lawson, Mr Richard Pauku, Ms Michaelie Pollard and Ms Andrea Pullo, for agreeing to provide assistance during the Joint Conference as required.

CRC Reef Research Centre, for providing some wonderful images for use on the Compendium cover.

…and most importantly, to all of our Delegates for supporting the Joint Conference. We hope you enjoy the daily activities and presentations organised.

SOCIAL PROGRAM

WELCOME RECEPTION

The Conference Welcome Reception will be held on Monday, 22 November 2004 from 6.00pm to 7.00pm in the pool and function area on Level 3 of the Hotel. Delegates are invited to mingle with other participants and enjoy complimentary drinks and nibbles.

The Registration Desk will be located at the Level 3 function area on Monday evening, and will be staffed from 5.30pm to 7.00pm to allow delegates to register and submit their posters.

POSTER SESSIONS

Two Poster Sessions are included in this year's Conference Program.

Complimentary beer, wine and nibbles will be provided at each Poster Session, with basic spirits and other items available for purchase (refer Appendix A for Bar Price List).

CONFERENCE DINNER

Included in the Conference Registration, this year's Conference Dinner will be hosted by Sunlover Cruises, who will ensure the group enjoys a luscious buffet dinner whilst cruising the Cairns area.

Boarding Time:	Delegates must be assembled in the Hotel Foyer by 6.20pm on Wednesday evening for a short walk to the boat for boarding by 6.45pm and departure promptly at 7.00pm.

ANNUAL AWARDS

Ah yes… what Conference Dinner would be complete without the infamous Annual Awards for exceptional feats or faux pas?

Nominations for Annual Awards may be placed in the Awards Box located on the Registration Desk throughout the Conference any time up until lunch time on Wednesday, 24 November. Awards will be presented at the Conference Dinner.

CONFERENCE PROGRAM

PRELIMINARY – MONDAY 22 NOVEMBER 2004

1800 – 1900 **Informal Welcome Reception, poolside on Level 3**
Includes Registration and drinks/nibbles

DAY ONE – TUESDAY 23 NOVEMBER 2004

RAINFOREST TO REEF RESEARCH: Practical Solutions for Critical Environmental Issues

0730 – 0830 **Registration Desk Open**
Tea and coffee available in Hotel Foyer

Delegates move into Grand Ballroom for commencement of Day One presentations.

0830 – 0835 **Introduction**
Professor Richard Pearson (JCU)

0835 – 0850 **Welcome to Country Presentation**
Mr Seith Fourmile

0850 – 0900 **Introduction to Catchment to Reef Joint Program**
Professor Richard Pearson, Program Leader (JCU)

0900 – 0915 **Keynote Presentation**
Cr Mike Berwick, Douglas Shire Council

0915 – 1040 **Catchment to Reef Forum**
Chaired by Professor Richard Pearson (JCU)

0915 – 0945 Introduction to Catchment to Reef Tasks by Task Leaders
Task 1 – Mr Jon Brodie (ACTFR)
Task 2 – Mr Barry Butler (ACTFR)
Task 3 – Professor Angela Arthington (GU)
Task 4 – Professor Angela Arthington (GU)
Task 5 – Dr Miles Furnas (AIMS)
Task 6 – Dr Katharina Fabricius (AIMS)
Task 7 – Mr Tim Prior (for Professor Richard Pearson) (JCU)

0945 – 1040 Discussion Session

1040 – 1110 **Morning Tea in Hotel Foyer**

1110 – 1300 **Case Studies**
Chaired by Bill Shannon (FNQ NRM Ltd)

1110 – 1120 Introduction by Bill Shannon (FNQ NRM Ltd)

1120 – 1145 Facilitating self-regulation by industry
Mr Ian Rankine (Four T Consulting)

1145 – 1210 Douglas Shire Council Water Quality Improvement Program:
What was done, what was learnt, what is recommended
Brian Roberts (CSIRO)

1210 – 1235 Six steps to implementing sustainable nutrient management in the Australian sugar industry
Dr Andrew Wood (CSR), Dr Bernard Schroeder (BSES), Bob Stewart (JCMA)

1235 – 1300 Burdekin Grazing Lands Project
Greg Brown (Grazier)

1300 – 1400 Lunch in Function Area, Level 3 of Hotel

1400 – 1600 Concurrent Themed Catchment to Reef Workshops

- Incentives for On-farm Natural Resource Management
  Tim Wrigley (Canegrowers), Dan Clowes (Griffith University), Geoff McDonald (CSIRO), Margie Milgate (Growcom)
  NB: This workshop to be held in Rosser Room on Level 1 to enable recording of discussions.

- Natural Resource Management Regional Arrangements and NHT2: Where to from here?
  Rebecca Clear (NRM Facilitator) and Nigel Weston (FNQ NRM Ltd/ Rainforest CRC)
  NB: This workshop to be held in Tully Room 1 on Ground Level.

- Grazing Lands Classification and Management
  Jim Kernot, Joe Rolfe, Peter O'Reagain (DPI&F)
  NB: This workshop to be held in Grand Ballroom (with central dividing wall in place).

- Water Quality Monitoring and Community Involvement
  Jon Brodie (ACTFR), David Haynes (GBRMPA) *et al.*
  NB: This workshop to be held in Grand Ballroom (with central dividing wall in place).

1600 – 1620 Afternoon Tea in Hotel Foyer

Delegates move back into Grand Ballroom.

1620 – 1720 Reports on Workshop Outcomes
Feedback from Workshops by Bryony Barnett and Tim Prior

1720 – 1730 Wrap Up and Housekeeping
Outline of Day Two Activities

1730 – 1900 Poster Session and Information Sharing in Tully Rooms 2 and 3
Includes drinks and nibbles

DAY TWO – WEDNESDAY 24 NOVEMBER 2004

Day Two comprises two main events, held concurrently:

RAINFOREST TO REEF RESEARCH (CONTINUES): Practical Solutions for Critical Environmental Issues

Full Day **Catchment to Reef Field Day**
Three alternative day trips to various sites around the Cairns region to view the application of water quality management processes and related issues.

See page 25 of this booklet for proposed Field Trip schedules.

Field Trip 1: Mossman/Port Douglas Organised by Brian Roberts	**Field Trip 2:** Atherton Tablelands Organised by Tim Prior	**Field Trip 3:** Russell/Mulgrave, Johnstone and Tully/Murray Catchments Organised by Tim Prior
Visits to sites established by the Douglas Shire Water Quality Improvement Project. These sites will primarily show management actions being undertaken within cane farms of the region.	(Mareeba) Sediment detention on banana property; measuring sediment/nutrient run-off from bananas. (Malanda) Riparian fencing for erosion mitigation on a dairy property. (Lake Eacham) Visit to TREAT Nursery; discussions with Dulgaburra Yidingi Traditional Owners on water quality monitoring practices. (Yungaburra) Burchill dairy property; TREAT Peterson Creek revegetation site.	(Russell/Mulgrave) Mulgrave Landcare sites. (Johnstone) Liverpool Creek revegetation (Ma:Mu Aboriginal Corp); Johnstone River Catchment Management Association. (Tully/Murray) Measuring sediment/nutrient run-off from banana and sugarcane lands in the Tully/Murray catchment (Landcare, ACTFR, NR&M).

TROPICAL FUTURES

0730 – 0830 **Registration Desk Open**
Tea and coffee available in Hotel Foyer

Delegates move into Grand Ballroom for commencement of Day Two presentations.

0830 – 0900 **Introduction to Tropical Futures Component**
Associate Professor Steve Turton, Rainforest CRC
Professor Nigel Stork, Rainforest CRC

Community Forum 1 – Threats to Landscape Integrity and Ecosystem Resilience
Chaired by Associate Professor Steve Turton, Rainforest CRC

What are the key research issues?

0900 – 0930 Keynote Address
Dr David Westcott, CSIRO Tropical Forest Research Centre
"Threats to landscape processes"

0930 – 0950 Dr Stuart Phinn, The University of Queensland
"Monitoring biophysical parameters of the Wet Tropics: changes in vegetation cover, vegetation structure and primary productivity"

0950 – 1010 Professor Roger Kitching, Griffith University
"Future of canopy research"

1010 – 1030 Dr Kristen Williams, CSIRO Sustainable Ecosystems
"A conceptual framework for conservation planning in the Wet Tropics"

1030 – 1100 Morning Tea in Hotel Foyer

1100 – 1120 Dr Steve Williams, James Cook University
"Surviving climate change: what are the possibilities for ecological and evolutionary adaptation?"

1120 – 1140 Professor David Gillieson, James Cook University
"Mapping rainforest fires in the Wet Tropics"

1140 – 1200 Dr Miriam Goosem, James Cook University
"Linear infrastructure impacts and mitigation"

1200 – 1220 Dr Sandra Pannell, Rainforest CRC
"The Lie of the Land: Co-producing Landscapes on the Atherton Tablelands"

1220 – 1300 Open Discussion with Panel

1300 – 1400 Lunch in Function Area, Level 3 of Hotel

Community Forum 2 – Integrating Scientific Research, Conservation Planning and the Community
Chaired by Professor Nigel Stork, Rainforest CRC

1400 – 1430 Keynote Address
Associate Professor Carla Catterall, Griffith University
"Landscape restoration in Australian rainforest regions: opportunities and challenges for science and action"

1430 – 1445 Mr Russell Butler Jr., Aboriginal Rainforest Committee
"Traditional Owners' perspectives"

1445 – 1500 Mr Chris Robson, Natural Resources and Mines
"Management agency perspectives"

1500 – 1515 Mr Campbell Clarke, Wet Tropics Management Authority
"Wet Tropics Management Authority perspectives: the Conservation Strategy"

1515 – 1530 Mr Peter Tabulo, Cairns City Council
"Local government perspectives"

1530 – 1545 Afternoon Tea in Hotel Foyer

1545 – 1600 Mr Nigel Weston and Ms Libby Larsen, FNQ NRM Ltd/Rainforest CRC
"Planners' perspectives"

1600 – 1615 Mr John Rainbird, Cairns and Far North Environment Centre
"Environment and conservation perspectives"

1615 – 1700 Open Discussion with Panel

1700 – 1830 Housekeeping, followed by Poster Session in Tully Rooms 2 and 3

1830 – 2200 Conference Dinner
Aboard Sunlover Cruises vessel, cruising the Trinity Inlet. Boarding at 6.45pm.
Delegates are requested to meet in Hotel Foyer by 6.30pm sharp for short walk to Wharf.

DAY THREE – THURSDAY 25 NOVEMBER 2004

TROPICAL FUTURES (CONTINUES)

0800 – 0900 **Registration Desk Open**
Tea and coffee available

Delegates move into Grand Ballroom for commencement of Day Three presentations.

Community Forum 3: Tropical Futures – Where do we go from here?
Chaired by Mr Jim Petrich, Cairns Regional Economic Development Corporation

0845 – 0900 Introduction by Mr Jim Petrich, Cairns Regional Economic Development Corporation

0900 – 0930 Mr Cam Charlton, Tourism Tropical North Queensland

0930 – 1000 Professor Norman Palmer, James Cook University

1000 – 1030 Professor Nigel Stork, Rainforest CRC

1030 – 1100 Morning Tea in Hotel Foyer

1100 – 1130 Dr Rosemary Hill, Australian Conservation Foundation

1130 – 1200 Mr Lohi Matainaho, Papua New Guinea Institute of Biodiversity

1200 – 1230 Dr Henrietta Marrie, Christensen Fund

1230 – 1400 Lunch in Function Area, Level 3 of Hotel

1400 – 1430 Professor Julian Cribb, Julian Cribb and Associates

1430 – 1500 Mr Jim Petrich, Cairns Regional Economic Development Corporation

1500 – 1600 Audience and Panel Discussion

1600 – 1630 Housekeeping and Close of Conference

PRESENTATION AND WORKSHOP OVERVIEWS AND ABSTRACTS

RAINFOREST TO REEF WORKSHOP OVERVIEWS

1. INCENTIVES FOR ON-FARM NATURAL RESOURCE MANAGEMENT

Chaired by Bill Shannon, Industry Representative and Board Member, FNQ NRM Ltd

Farmers in Queensland are constantly changing farming practices to improve their profitability and reduce their impacts on the environment. Regional Natural Resource Management (NRM) Groups are investigating what methods best encourage growers to accelerate and participate in new practices, which continue to increase farm profitability and environmental sustainability. Incentive programs are being promoted as a key mechanism for this change management.

This workshop will investigate the theory and experience surrounding various incentive programs. The focus will be on developing a program of incentives using best available methodologies and practices to engender change at an industry, regional or farm level.

It is likely a follow up meeting will be held to finalise these outcomes in early 2005, to disseminate outcomes to all NRM bodies, government officers, research organisations and peak industry bodies.

Speakers

Geoff McDonald, Regional Planner, CSIRO Sustainable Ecosystems
***The Reason** - NRM Priorities*

Geoff will discuss the many areas that regional NRM bodies may consider for investment. Based on regional priorities these could include upgrading irrigation and fertiliser equipment, putting in erosion control systems such as sediment traps, undertaking laser levelling and implementing controlled traffic programs, gaining necessary training and support.

John Tisdale, Assistant Professor in Environmental Economics,
CRC for Catchment Hydrology, Griffith University
***What** are incentive programs and how do they work?*

John will outline what are the current economic models for incentive programs – both field and experimental - in order to facilitate change management in agricultural sectors

Jim Binney, Director Catchment Economics, Department of Natural Resources
*The **Government's view** on incentive programs*

Jim will talk about the government's view of incentives programs and how they are assessed as delivering change management in a catchment scenario.

Margie Milgate, Natural Resources Network Coordinator, Growcom
***An Example** of a program in Queensland. How did it work on the ground?*

Margie will discuss the incentives program that was developed for the fruit and vegetable sector in Queensland. The program was part of the Rural Water Use Efficiency Program, funded by DNR&M and known as Water for Profit.

Following the presentations the floor will be open to questions, and a workshop that will seek answers to the following questions.

How important are incentives for change management? Do we need incentives to create the change?
What are the best types of incentives that will achieve farm profitability and better environmental outcomes for the Great Barrier Reef?
What lessons can we learn from overseas and domestic experiences?
Who should get incentives?
Who should be in charge of the incentives program?

2. NATURAL RESOURCE MANAGEMENT REGIONAL ARRANGEMENTS AND NHT2: WHERE TO FROM HERE?

Chaired by Rebecca Clear and Nigel Weston

Regional Natural Resource Management Planning

What is it for, and what are the processes? Why the transition to NHT2? What stage are we at now, and where are we heading?

FNQ NRM Ltd Case Study: The regional NRM plan, the Aboriginal Natural and Cultural Resource Management Plan, the Regional Investment Strategy, the process for identifying priorities for investment, investing in community capacity, setting up for long term success, FNQ NRM Ltd Membership.

The challenge for regional NRM groups in the new regional NRM arrangements

Roles

The role of regional bodies: NRM plans and Regional Investment Strategies
The role of the State and Commonwealth Governments in NHT2 delivery (including State in-kind and what it means)
What does this mean for community? Where does community fit in? How can community achieve their activities in these arrangements?
Traditional Owner involvement in natural resource management and basic Traditional Owner Engagement Principles

Implementing the Plan

Managing the transition from planning to implementation

Funding

What, where and how much?

Funding programs under the NHT2, National Action Plan for Salinity and Water Quality and the National Landcare Program – identifying current and new funding buckets – how full?
Indicative funding allocations – what does it mean and how will it work?

How to….?

How to find out about available funding
How to access the funds from different buckets
Public vs. Private Benefit – what does Government consider in approving funds?
How to write a successful funding application

WORKSHOP ACTIVITY Envirofund – What makes a successful project; tips to successful Envirofund applications

National priorities for investment –what does this mean in terms of the NRM outcomes we want to achieve at the regional level?

Thinking Outside the Square

New approaches to doing business – Environmental Management Systems, Market Based Instruments, Farm Management Systems, Auctions, Bush Tenders, etc.
Funding outside of NHT2, NAPSWQ and NLP programs – includes Indigenous programs, philanthropic programs, etc.
Cooperative approach to achieve NRM outcomes – a look into partnerships and sponsorships

WORKSHOP ACTIVITY Setting your group up for sponsorship – how to be successful in the regional arrangement environment

3. GRAZING LANDS CLASSIFICATION AND MANAGEMENT

Chaired by Jim Kernot and Joe Rolfe

This workshop will expand on the issues raised in the case study presented by Greg Brown *et al.*

It will explain the Grazing Land Management (GLM) project and the A,B,C,D land condition assessment in greater detail. In particular the tools that were developed including the description of land types used and the individual yield and land condition assessments associated with the various land types.

The use of GLM to determine land condition targets in conjunction with community groups will be outlined.

The GLM+ process that works with individual properties to measure their land condition and identifies strategies to ensure both sustainability and viability will be detailed using actual case studies.

4. WATER QUALITY MONITORING AND COMMUNITY INVOLVEMENT

Chaired by Jon Brodie

A half day workshop to discuss the tools, foci and integration of monitoring programs being undertaken by community, regional, State and Commonwealth groups to address the Reef Water Quality Protection Plan objectives.

A brief presentation (five to ten minutes) will be given on each of the five focus groups and then participants will divide into groups for further discussion. There will be an opportunity to rotate through the groups.

1400 – 1500 Brief background presentations

1500 – 1600 Focus Sessions (rotate every twenty minutes)

Tools available for monitoring changes in land use, pollutant inputs to waterways, water quality of freshwater systems, the interface between fresh and marine systems and water quality in the marine environment.

Jon Brodie
Barry Butler

Research (current and future innovative) for assessing fresh water quality and the health of terrestrial ecosystems, including role of SIPs.

Barry Butler
Ian Duncan

Research (current and future innovative) for assessing marine water quality and the health of inshore marine ecosystems.

David Haynes
Jochen Muller
Johanna Johnson

Supporting community involvement in regional water quality monitoring partnerships, and what tools and strategies are available or under development.

Chris Chinn
Tanya Ashworth

Incorporating local information at the regional and catchment scale and methods for integrating catchment and marine monitoring programs.

Claire Rogers
Ian Rankine
Len McKenzie

1600 – 1620 Afternoon Tea

1620 – 1720 Reports on Workshop Outcomes

Return to Conference group for a synthesis of the discussions held in each concurrent themed workshop.

Facilitators will undertake the preparation of an outcome paper on involving community in monitoring, capacity building and integrating monitoring programs.

RAINFOREST TO REEF FIELD TRIP OVERVIEWS

The Conference Secretariat wish to extend thanks to FNQ NRM Ltd for sponsoring the Catchment to Reef Field Day.

FNQ NRM (Far North Queensland Natural Resource Management) Ltd is an organisation dedicated to working toward the conservation and sustainable use of natural resources in the Wet Tropics Natural Resource Management Region.

Across Australia, bodies such as FNQ NRM Ltd are the Federal and State Governments' primary mechanism for involving the community in making decisions about natural resources and directing funds to manage the environment, including forming partnerships to foster awareness, goodwill and commitment toward finding innovative solutions and making changes that improve and maintain our natural environment.

The Wet Tropics Natural Resource Management Region extends from Bloomfield in the north, south to Ingham and west to Mount Garnett, and includes the Atherton Tablelands.

FIELD TRIP 1:
Mossman/Port Douglas

0800 – 0900 **Depart Cairns International Hotel Foyer**

0900 – 1000 **Arrive Douglas Shire Council, Mossman**

Overview of on-ground activities in six water quality projects on the Daintree, Mossman, Saltwater and Mowbray Rivers

1000 – 1030 **Drive to Saltwater Creek via Mossman Mill**

Inspection of wetlands, riverine vegetation and corridor planning. Visit to nitrogen run-off and drainage trials.

1030 – 1100 **Morning Tea**

1100 – 1200 **Drive to Daintree River**

Automatic event water sampling infrastructure. Discussion of community monitoring during ambient conditions.

1200 – 1300 **Lunch at Mossman Gorge**

1300 – 1430 **Return to Mossman**

Wetland rehabilitation. Riverine vegetation inspections. Discussion on corridor planning.

1430 – 1600 **Return to Cairns International Hotel**

FIELD TRIP 2:
Atherton Tablelands

0800 – 0915 **Depart Cairns International Hotel Foyer**

0915 – 1000 **Arrive Mareeba**

Inspection of grazing properties of various land condition. Discuss issues and grazing lands management processes.

1000 – 1030 **Morning Tea**

1030 – 1200 **Depart Mareeba, travel to Malanda**

Visit to Glen Drury Dairy Property. Discuss riparian fencing and revegetation. Concrete river crossing installation.

1200 – 1230 **Lunch**

1230 – 1345 **Travel to presentation site.**

Presentation on Tablelands Landcare revegetation works (Helen Irwin). Presentation on irrigation efficiency on the Tablelands (Russell Malloy and Russell Fry).

1345 – 1515 **Travel to TREAT Nursery (Trees for the Evelyn and Atherton Tablelands), Queensland Parks and Wildlife Service Centre for Tropical Restoration**

Introduction to TREAT revegetation activities (Peter Dellow and Barbara Lansky). Caring for Country (Doug Stewart, Traditional Owner), view TREAT display. Afternoon Tea included.

1515 – 1630 **Travel to Doug Burchill property**

TREAT riparian planting, Peterson Creek, Yungaburra

1630 – 1730 **Return to Cairns International Hotel**

FIELD TRIP 3:
Mulgrave/Johnstone Catchments

0800 – 0830 **Depart Cairns International Hotel Foyer**

0830 – 1030 **Arrive Mulgrave Catchment**

Mulgrave Landcare sites. Drive past two cane farms demonstrating cane BMP, visit Theos Creek revegetation/instream sediment trap/illustrate water monitoring equipment.

1030 – 1045 **Morning Tea**

1045 – 1200 **Discussion of activities at Mulgrave Catchment, travel to Innisfail**

1200 – 1245 **Arrive Innisfail, Lunch**

1245 – 1330 **Travel to Moresby River**

Examination of sediment deposits

1330 – 1430 **Travel to Liverpool Creek**

Riverbank stabilisation work (community collaboration). Presentation by Johnstone River Improvement Trust (Elaine Ridd). Presentation by Traditional Owners (Ma:Mu Aboriginal Corporation, Dean Purcel *et al.*). JRCMA presentation (Bob Stewart).

1430 – 1530 **Travel to Reira's Bend on South Johnstone River**

Rehabilitation of both hard and green engineering.

1530 – 1600 **Travel to Cecchi's farm**

Precision fertiliser application. On-farm silt traps.

1600 – 1700 **Returns to Cairns International Hotel**

PRESENTATION ABSTRACTS

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(Case Study – Day One)

Facilitating self-regulation by industry

Bill Wilkinson[1] and Ian Rankine[2]
[1]Department of Natural Resources and Mines, Emerald
(email: william.wilkinson@nrm.qld.gov.au)
[2]4T Consultants Pty Ltd, Emerald
(email: fourt@bigpond.net.au)

This paper explores how a landscape- or area-wide approach can establish a self-regulation environment for natural resource management that lies within the bounds of the existing regulation framework administered by government.

There is no doubt that legislation must underpin the objectives of government and industry, which among other things, is the pursuit of sustainable environmental outcomes and vibrant, economic businesses and communities. Implementing an appropriate mix of regulation, policy and other approaches is an ongoing conundrum that faces government, industry and the general public. This paper challenges the continued focus on natural resource management by policy and regulations established by centralised planning that have been largely determined by government scientific studies.

Self-regulation encourages participation and engagement. A successful case study and pilot project called Integrated Area Wide Management (IAWM) within the Fitzroy Basin, is described and demonstrates the foundations of how self-regulation can work in practice. The pilot project has been successful in engaging landholders and the community. It has required participants (landholders, peak industry, private sector and government) to be flexible and mature enough to work differently and jointly commit to building a landscape scale monitoring and information support system. The IAWM system now enables the local community of interest to look at natural resource management solutions pro-actively and they can now participate more confidently within a 'safe' learning environment. Surely that is where we all need to be in the future.

(Case Study – Day One)

Douglas Shire Water Quality Improvement Program: What was done, what was learnt, what is recommended

Professor Brian Roberts
CSIRO Sustainable Ecosystems

At the end of 2002, the Commonwealth Government agreed to provide funding for the development of a Water Quality Improvement Program for waterways in Douglas Shire, as a basis for a longer-term strategy for achieving water quality targets for the Daintree, Saltwater, Mossman and Mowbray River catchments. An integral part of this process involved stakeholder consultation in order to determine environmental values, water quality issues and water quality objectives for the waters of the Douglas Shire, and to develop and assess alternative management strategies to improve water quality.

The Douglas Shire Council subsequently made a successful application to the Department of Environment and Heritage (DEH) for funding to develop a Water Quality Improvement Program within the Douglas Shire Catchments to help implement the Plan. The funding package was part of the Natural Heritage Trust priority for improving water quality entering the Great Barrier Reef Lagoon, and was provided under the Coastal Catchments Initiative. The Program comprises five priority action projects, namely:

- Adoption of Agricultural Best Management Practices for Sediment and Nutrient Reduction in Douglas Shire;
- Determination and Demonstration of Agricultural Best Management Practices in Saltwater Creek Catchment of Douglas Shire;
- Control of Point Source Discharges of Sediment and Nutrient in Douglas Shire;
- Protection and Restoration of Riparian and Wetland Areas in Douglas Shire; and
- Monitoring and Modeling of Sediment and Nutrient Flow Within and From Waters of Douglas Shire.

The total program is a complex set of 94 tasks being actioned by eleven partners over two years, which will be followed by a simpler ongoing Shire and community program in which a stream health index replaces laboratory analyses. The DEH-funded program is limited to monitoring sediment and nutrients in the Shire's four main catchments, so Council has expanded its coverage. The Australian Institute of Marine Science has been contracted to monitor water quality (including pesticides) and coral health on the Shire's inshore marine environment. Studies on groundwater, estuary sediment movement, benchmark pristine streams, seagrass beds and grazing management are currently being developed to augment the Water Quality Improvement Program.

(Case Study – Day One)

Six steps to implementing sustainable nutrient management in the Australian sugar industry

Dr Andrew Wood[1], Dr Bernard Schroeder[2], Dr Phil Moody[3] and Mr Bob Stewart[4]
[1]CSR Sugar, Macknade
[2]BSES Limited, Bundaberg
[3]Department of Natural Resources and Mines, Indooroopilly
[4]Johnstone River Catchment Management Association

The Australian sugar industry is under increasing pressure to minimise the loss of nutrients from applied fertiliser and to reduce the overall costs of production. An approach to sustainable sugarcane production has been developed, where soil and nutrient management guidelines are tailored to different climatic areas and to the specific properties of different soils.

The adoption of best practice nutrient management in the sugar industry involves around six easy steps:

1. Knowing your soils;
2. Understanding and management soil and nutrient processes;
3. Regular soil testing;
4. Adopting soil specific fertiliser guidelines;
5. Using leaf analysis to check on the adequacy of fertiliser inputs; and
6. Adopting a good record keeping system and modifying nutrient inputs when and where necessary.

This paper will explain how this approach has been developed for different sugar producing regions in Queensland.

(Case Study – Day One)

Burdekin and Upper Herbert grazing lands

Greg Brown[1], Jim Kernot[2] and Joe Rolfe[2]
[1]Grazier
[2]Department of Primary Industries and Fisheries

The presentation will detail issues of land condition and land management for the extensive grazing areas in the Burdekin and Herbert Catchments. It will examine the impact on sediment and nutrient movement on the Great Barrier Reef. Emphasis will be placed on the importance of ensuring adequate ground cover of the native pastures at the onset of the wet season. While sustainable grazing management practices are essential, the need for viable rural communities is equally important. Successful strategies to ensure both sustainable and viable enterprises will be discussed.

The Grazing Land Management (GLM) project will be detailed. GLM utilizes the A,B,C,D land condition assessment process and is being used to work with the grazing industry to identify actual land condition, hot spots and management strategies to address any problems.

Current trial work addressing sustainable grazing management, including the Wambiana and Virginia Park trials will be highlighted.

A number of grazier forums on issues of land management have recently been held and the positive outcomes of these meetings will be discussed.

Monitoring biophysical parameters of the Wet Tropics: changes in vegetation cover, vegetation structure and primary productivity

Associate Professor Stuart Phinn[1], Dr Catherine Ticehurst[2], Dr Damien Barrett[2], Dr Alex Held[3], Ms Joanne Nightingale[1] and Mr Kasper Johansen[1]
[1]Centre for Remote Sensing and Geographic Information Science, The University of Queensland, Brisbane
[2]Environmental Remote Sensing Group, CSIRO Land and Water, Canberra
[3]CSIRO Office of Space Science Applications, Canberra

The aim of Project 1.2 within the Rainforest CRC has been to develop and evaluate approaches to map and monitor key environmental indicators in the Wet Tropics. This paper reports on the current status of the project, in terms of completed proof-of-concept applications and ongoing work for operational monitoring. Our team has focussed on four sub-projects in the past two years:

1. Assessment of vegetation cover pre- and post-World Heritage listing of the Wet Tropics (1988-1999);
2. Development of all-weather imaging radar applications for mapping forest composition and structure;
3. Regional scale monitoring of the Wet Tropics on a monthly basis using MODIS vegetation index data; and
4. Development of a spatial model for estimating net-primary production in the Wet Tropics.

Assessment of vegetation cover pre- and post-World Heritage listing of the Wet Tropics was based on differences between vegetation indices derived from Landsat Thematic Mapper images collected in 1988 and 1999. The largest changes observed were dominated by partial regeneration around drainage lines and on the sclerophyll and wet tropical forest boundary. Imaging radar applications were able to map vegetation communities to a similar level as the Tracey and Walker vegetation map, and were also able to detect tree-fall gaps in mesophyll vine forest produced by tropical cyclones. MODIS vegetation index images are collected twice daily for the Wet Tropics and comparison with higher resolution Landsat Thematic Mapper image data indicates they can be used to detect clearing, fire-scars and canopy thinning. To provide a Wet Tropics carbon-accounting model, point-based and spatial forms of a model for predicting temperate forest growth (3-PG) were modified based on extensive literature review and field data collection work. Application and validation of the model indicated that it could be used to reliably estimate forest growth over time. Work is continuing on development of a rainforest monitoring website to deliver updated vegetation index maps for use in local to regional scale monitoring and management.

Mapping rainforest fires in the Wet Tropics

Professor David Gillieson and Mr Les Searle
School of Tropical Environment Studies and Geography, James Cook University, Cairns

A variety of products, such as MODIS and ASTER, are now available to map hotspots and fire scars at a very coarse spatial scale over tens of kilometres. At a local scale, researchers and managers interested in fire extent and history, and their ecological consequences, have a more limited choice. We report on the use of multi-temporal IKONOS imagery for mapping firescars resulting from bushfires in the Smithfield Conservation Park during November and December 2002. This was a one in one hundred year event which patchily burnt steep rainforested ridges of the McAllister Range over a three week period. The imagery was orthorectified using a DEM and ground control points, and resampled to provide one metre multispectral data. Image processing techniques included change detection in vegetation indices and land cover classification. We discuss the implications of the fire patchiness for rainforest regeneration and hillslope erosion.

Linear infrastructure impacts and mitigation

Dr Miriam Goosem
School of Tropical Environment Studies and Geography, James Cook University, Cairns
and Rainforest CRC

Clearings for linear infrastructure such as roads, highways and powerlines cause a variety of impacts on rainforest ecosystems. Habitat for both flora and fauna is lost through clearing and altered via edge effects. Changes in light levels, air and soil temperatures, humidity and wind occur in the clearing and penetrate into the forest, altering both vegetation and faunal habitat. Weeds dominate in clearings and fauna including feral animals that are alien to rainforest are common and these species may then invade the forest proper. Disturbance from noise, traffic movement, headlights and pollutants are insidious impacts that follow roads and highways, while roadkill is more obvious. Erosion and changes in ground and surface water flows may also occur with consequent impacts on rainforest streams. These factors combine so that linear clearings form barriers to movements of animals with possible effects on dispersal and pollination of rainforest plants.

How can we keep such impacts to a minimum in the face of increasing human populations and their demand for power and transport? If we must have such infrastructure, is it possible to at least reduce these impacts on our World Heritage rainforests? I will discuss what might be considered an ‘ideal rainforest road’ as well as less ideal linear infrastructure. Recent examples of strategies for mitigating the impacts of powerlines, roads and highways shall also be discussed, together with research on their effectiveness or detailed consideration of the likelihood of mitigatory success. Examples include the installation of underpasses on the East Evelyn Road upgrade on the Atherton Tablelands, the provision of rope bridge overpasses for arboreal species, the stringing of powerlines on high towers above the rainforest canopy and latest designs for the upgrade of the Kuranda Range highway. Often compromises are required, involving case-specific decisions regarding relative importance of impacts and therefore where emphasis must be placed for mitigation.

Landscape restoration in Australian rainforest regions: opportunities and challenges for science and action

Associate Professor Carla P. Catterall.
Environmental Sciences, Griffith University, Nathan

The rainforest regions of the Australian tropics and subtropics are widely known for their biological richness, and scenic and heritage values. Rainforest has shown some resilience in the face of past climate-driven contractions, but how well will it survive when faced by the combined onslaught of modern clearing, climate change and species invasions?

In recent decades there has been a shift in public attitude, from viewing the forests as sources of timber, or as impediments to development, to conserving and protecting what remains. While significant areas are now conserved within montane World Heritage areas in both regions, there are large tracts of level and low lying country, mostly in private ownership, which have been almost denuded of forest cover. In these areas, remnant patches of unique forest types may be the 'living dead', destined for long-term degradation and species loss, unless more extensive forest cover is restored.

Regional biodiversity and local catchment and climatic processes also depend on an adequate forest cover. Achieving this presents new challenges to science and society. We need ways of cost-effectively restoring larger areas, ways of matching the quality and quantity of restored forest to clear ecological goals, of understanding and reconciling differing goals of reforestation, of integrating conservation and restoration, of integrating scientific knowledge with on-ground actions, and of understanding landholder motivations. All these require more effective collaboration and information exchange between scientists and citizens. But scientific research is only beginning to provide sufficient knowledge of the impacts of deforestation and the effects of reforestation, whereas the environmental imperative is clearly to act now. This creates a situation where scientific information is ignored, misused, or used with significant risk of error. For example, recent government initiatives have encouraged local communities and landowners to plant trees, but this has often been planned on the basis of untested assumptions. These limitations can be reduced if scientists and community members can adopt a more experimental approach to reforestation activities, which, coupled with monitoring and analysis, can both make future efforts more effective and build a predictive understanding of the ecological processes involved. In this talk I will draw on case studies and experience from work with colleagues within the Rainforest CRC to illustrate these issues.

POSTER ABSTRACTS

Poster Abstracts for both Poster Sessions are listed here in alphabetical order. Those marked with an asterisk (*) identify Students' posters, which will also be assessed for the Student Poster Competition.

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Ms Sandra Abell, Associate Professor Paul Gadek and Dr Brad Congdon
School of Tropical Biology, James Cook University, Cairns

Habitat associations of ectomycorrhizal truffle fungi along a gradient of wet to dry sclerophyll forest

Northern bettongs, *Bettongia tropica*, are principally mycophagous (fungus eating) marsupials of the family Potoroidae. They are listed as endangered under the *Queensland Nature Conservation (Wildlife) Regulation 1994* and the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999*. *B. tropica* occur in wet to dry sclerophyll forest, dominated by ectomycorrhizal *Eucalyptus* and *Allocasuarina* tree species. It has been hypothesised that *B. tropica* are restricted within habitats that support a high diversity, high abundance and low seasonality of ectomycorrhizal truffle fungi. In this poster, I will be presenting the preliminary results from two sampling trips to Davies Creek Far North Queensland, performed in the Early Dry and Late Dry seasons. Significant results include relationships between Bioclim estimated annual precipitation (the wet to dry gradient) and truffle species diversity, truffle abundance and truffle dry weight. Correlations between truffle abundance, site characteristics and floristics will also be presented.

Mr Peter Byrnes
Department of Tropical Environment Studies and Geography, James Cook University, Cairns

The impact of roads on the movement of medium-sized, ground-dwelling rainforest mammals.

The impact of roads on animals varies depending on numerous characteristics of the road, including traffic volume and speed, road width and canopy cover. These impacts range from the highly visible (e.g. road mortality) to the more cryptic (e.g. possible noise impacts). An important cryptic impact is the effect that roads and traffic have on animal movement. This is facilitated by the linear barrier effect of the road, which includes avoidance of the road due to noise, light, pollutants, mortality and changes in microclimate and vegetation near the road due to edge effects.

The aim of this study was to examine the impact of roads on the movement of ground-dwelling rainforest mammals of the Wet Tropics. Medium-sized animals were targeted, including the long-nosed bandicoot (*Perameles nasuta*), giant white-tailed rat (*Uromys caudimaculatus*) and musky rat-kangaroo (*Hypsiprymnodon moschatus*), representing a range of habitat specificities. These species were trapped using drift fences and large wire cage traps. Following capture, target animals were ear-tattooed and tracked, using spool-and-line tracking. Mammals were tracked adjacent to a major highway, a narrow unsealed low-volume road through rainforest with canopy closure and in the forest interior, at least two hundred metres from any road. Shapes of spool tracks and predominant directions of movement were compared for any differences in movement patterns between the three species and adjacent to different road types.

Dr Rebecca Bartley[1], Mr Mark Disher[1], Mr Rex Keen[2]
[1]CSIRO Land and Water, Atherton
[2]CSIRO Land and Water, Townsville

Bank erosion in the Wet Tropics: is it important and can riparian vegetation help?

Sediment budgets are being extensively used in Australian catchments to evaluate the sources, pathways and sinks of sediment, particularly for rivers draining to the Great Barrier Reef (GBR) (e.g. McKergow *et al.*, In Press). The results of the sediment budgets are also being used to formulate policy related to land use practices and target setting for many catchments (e.g. Brodie *et al.*, 2001).

Sediment budgets generally involve estimating the contribution of sediment from three main processes: hillslope erosion, gully erosion and bank erosion. To date, the contribution of bank erosion in sediment budgets has been based on empirical relationships using limited data from a review of global meander migration estimates. In fact, data from only three Australian rivers, none of which are in the wet tropics, were included in the review. This is because there have been no known quantitative estimates of bank erosion for streams in North Queensland catchments. Without this basic field data, it is difficult to determine whether the current modelling tools are suitable for estimating bank erosion, particularly for tropical stream systems.

This study will address the data gap by monitoring the annual bank erosion rates for the Daintree River over the 2003-2006 period. The study is also looking at the effect of riparian vegetation on bank erosion rates. The results of this work with improve sediment budget estimates and provide advice on appropriate locations for riparian re-vegetation.

Brodie, J., Furnas, M., Ghonim, S., Haynes, D., Mitchell, A., Morris, S., Waterhouse, J., Yorkston, H., Andas, D., Lowe, D and Ryan, M. (2001) Great Barrier Reef Catchment Water Quality Action Plan. Great Barrier Reef Marine Park Authority, Townsville. http://www.gbrmpa.gov.au/corp_site/key_issues/water_quality/action_plan/.

McKergow, L. A., Prosser, I. P., Hughes, A. O. and Brodie, J. (In Press) Sources of sediment to the Great Barrier Reef World Heritage Area. Marine Pollution Bulletin.

Matt Bradford, Dr Andrew Dennis and Dr David Westcott
CSIRO Sustainable Ecosystems, Atherton

Diet preferences of the southern cassowary

The southern cassowary (*Casuarius casuarius*) is known to eat the fruit of at least 238 species of plant in north Queensland. We conducted an analysis of cassowary diet in upland rainforest on the eastern edge of the Atherton Tablelands by identifying components of dungs found along tracks and trails over a two year period. Fruits and seeds of 56 plant species were identified. Cassowaries showed preference for particular fruits with two species being present in 43.9% of all dungs and contributing to 30.5% of the total dung volume. The seasonal pattern of dung abundance closely followed that of fruit production in the forest with a peak in dung numbers between September and March and a trough between April and July. Cassowaries targeted large seeded fruit with 35.7% of all fruit species represented in the dungs considered to have large seeds, which is a significantly higher proportion than occurs in the forests of wet tropical North Queensland.

Ms Sally Bushnell
School of Tropical Environment Studies and Geography, James Cook University, Townsville

The effectiveness of revegetation corridors adjacent to faunal underpasses on the East Evelyn Road near Millaa Millaa

The rainforests of the Atherton and Evelyn Tablelands have been severely fragmented by farmland, roads and powerlines, subjecting many native species to the risk of local extinction. In addressing this issue and to mitigate problems of a road upgrade through rainforest of conservation significance, three faunal underpasses were installed together with adjacent revegetation corridors. To evaluate the effectiveness of these structures, I investigated whether (1) native rainforest species use the revegetation corridors; (2) individuals move through the underpasses; and (3) the incidence of roadkill has reduced since underpass and corridor completion.

The small mammal and bird communities of the area were studied through trapping, tagging, and observation respectively. Sand traps and infrared-triggered cameras within underpasses were used to monitor wildlife movements. Roadkill was monitored along road transects adjacent to underpasses.

Native rainforest species are utilising the revegetation corridors. Although over half of the small mammal captures were grassland/feral species (60%), 35% of individuals using the corridors were rainforest-dependent, compared with 98% at rainforest interior sites. A total of 25 bird species were identified using the corridors, thirteen of which are rainforest-dependent, whereas 21 rainforest-dependent species used the rainforest interior. This indicates that, although more time is required for corridor development before they more closely mimic the rainforest interior, the corridors already are effective for some rainforest species. A number of species moved through the underpasses including small mammals, such as rodents and bandicoots, and medium-sized mammals including pademelon. There were seven incidences of roadkill near the underpasses, including three feral cane toads.

The wildlife crossing structures and revegetated corridors at East Evelyn are proving to be effective for rainforest wildlife habitat as well as for habitat connectivity, through facilitating movements across an otherwise inhospitable barrier. Therefore they provide an example to be followed or modified in rainforests elsewhere in Australia and the world.

Chris Chinn, Nathan Johnston and Rob Cawley
Department of Natural Resources and Mines, Indooroopilly

Regional monitoring partnerships for waterway health

The Australian Government's natural resource management programs the National Action Plan (NAP) and the Natural Heritage Trust 2 (NHT2) are based on a regional community–based approach to planning and implementation built on the concept of 'healthy regional arrangements'. This new regional approach has significant implications for how stakeholders including whole of government, industry and community networks work together. The new arrangements have generated significant demand for information on waterway condition that in turn highlights the need for collaborative partnerships in regional waterway monitoring. Successful regional monitoring partnerships can improve the efficiency and effectiveness of data collection, and thus enhance the capacity of constituent stakeholders to address ecological issues at a range of scales. Key factors for success in monitoring partnerships, particularly engaging community NRM networks are discussed. In this paper we document the progress, challenges and findings of implementing these principles in Queensland through two contrasting frameworks namely the enhancement of the Ecosystem Health Monitoring Program in South-east Queensland administered through the Moreton Bay Waterways and Catchments Partnership and through supporting the development of regional water quality monitoring partnerships through the state-level NAP Water Quality Program.

Mr Greg Dawe
School of Tropical Environment Studies and Geography, James Cook University, Cairns

Traffic noise and its influence on the song of tropical rainforest birds

Human produced noise pollution is a dominant component of the sound environment of many tropical locations. In this study I ask whether vocally communicating species modify their signals to avoid this noise pollution. To do this I:

1. examined the attenuation of road traffic noise through tropical rainforest; and
2. described the vocalisations of selected songbirds to identify any frequency compensation to such noise.

Eight 200m long transects were established perpendicular to the Palmerston Highway. A series of controlled vehicle drive-by passes were conducted to allow 1/3 octave sampling of amplitude parameters across the 2.5Hz to 20kHz frequency spectra. Data were collected at one metre and 15-metres above ground level at seven locations along each transect.

Daytime ambient sound was recorded at three ground and three canopy positions on two of the Palmerston transects (medium-density traffic treatments), and on another transect off the Kuranda Range Road (heavy-density traffic treatment). Ambient noise data were also recorded at two control sites isolated by distances of approximately five kilometres from the highways.

I compared the noise frequency profiles of the transects to describe patterns of noise penetration at different heights in the forest and to identify diurnal patterns of anthropogenic noise. I also documented similar patterns of noise from natural processes such as wind, tree-fall, and defoliation, along with biotic sound production from cicadas, songbirds and amphibians.

Songs from 47 rainforest avian species were recorded within the above transects at the edge of the rainforest, at 200 metres, and at the control sites. Comparison between these sites of the vocalization frequencies and a range of song-traits of 13 selected songbird species allowed testing against road-noise spectrum components.

Despite deep penetration of traffic noise, rainforest birds do not appear to modify their songs to compensate for road noise.

Dr Andrew Dennis, Dr David Westcott, Mr Adam McKeown and Mr Matt Bradford
CSIRO Sustainable Ecosystems, Atherton.

Declining seed shadows for trees in habitat fragments

Increasingly, ecological sustainability is seen as a key goal of governments at all levels and of organisations and communities. But what is ecological sustainability, how do we measure it and how do we know if we are achieving it? To examine these issues we asked how a fundamental ecosystem process, seed dispersal, operates in different contexts within the landscape. The results are both encouraging and discouraging. By measuring and comparing the occurrence, abundance and behaviour of animals in continuous rain forest and rain forest fragments we are able to show the extent to which seed dispersal processes have declined for some plant species in fragments of habitat. We do this by estimating complete seed shadows for a range of rainforest flora in both contexts. We have demonstrated a decline in the number of seeds dispersed of up to 90% and in the distances that seeds are dispersed by up to 86%. Coupled with little change in predation rates for seeds this suggests a serious decline in the probability of new recruits for some species. Ultimately this could lead to the loss of species from fragmented communities. However, the process still operates in habitat fragments, albeit in a different form, and while some species suffer considerable loss of dispersal services, others do not and are likely to persist in the long term if rain forest fragments do not become too isolated.

Mr Mark Disher and Dr David McJannet
CSIRO Land and Water, Atherton

Groundwater control of a coastal vegetation mosaic

The coastal floodplain forests of north Queensland have been largely removed as a result of expanding agriculture in the Wet Tropics. It is now recognised that these forests may have played an important role in regulating and filtering wet season runoff. It is believed that the removal of these forests and replacement by agriculture may be contributing to higher sediment and nutrient loads to the Great Barrier Reef lagoon.

Recognition of the role of vegetation in filtering and regulating water flows from the coastal floodplains has led to the suggestion that re-establishing coastal forest types in key strategic areas may in fact help to improve water quality in the region. To investigate this further, we are studying the relationship between groundwater fluctuations and water balance of three research sites situated in different coastal forest types that occur in north Queensland.

One of these sites is situated at the Cowley Beach Training Area, and is one of the largest remaining areas of coastal forest in the Wet Tropics. The forest types at Cowley Beach grade from Melaleuca woodland with a sedge understorey in dune swales to eucalypts and rainforest on the dune ridges. The dune swale to ridge height difference is only small (less than five metres), however the vegetation change is very obvious and is believed to be linked to groundwater fluctuations.

Instrumentation has been installed at this site to measure groundwater levels at different locations across the dune system, tree water use and site weather conditions including rainfall, solar radiation, wind speed, temperature and humidity.

Our research to date has revealed that prolonged periods of elevated water tables and inundation during the wet season are most likely controlling vegetation distribution in this area. Through continued monitoring at this site, we hope to gain a better understanding of the processes controlling vegetation distribution on the coastal floodplain with the aim of informing better directed rehabilitation, revegetation and preservation projects in the Wet Tropics.

Alan Dunne[1], Elaine Ridd[1,2,3], John Ridd[2,3], Bob Stewart[3] and Bart Dryden[4]
[1]Johnstone Shire River Improvement Trust
[2]Johnstone River Catchment Management Association
[3]Johnstone Ecological Society
[4]Johnstone Shire Revegetation Unit

A prioritised management plan for the South Johnstone River and its major tributaries

River works are often done on an ad hoc basis, which leads to varying successes and the techniques applied are not always consistent. At times work is done out of proper sequence which reduces its effectiveness. Since river management work is expensive and funds are always short, it is necessary to move to a more strategic approach based on "conceptual framework for stream rehabilitation, planning and design". This involves a detailed examination of the streams on a reach by reach and a site by site basis, together with a structured system of prioritisation. The planning illustrated in this poster was put together by a team of experienced practitioners in wet tropic stream management supplemented where required by expert contractors from James Cook University.

The South Johnstone River was divided into 31 sites each of which was examined in detail against a number of prepared criteria. Based on those analyses, together with site assessment and aerial photo interpretation, proposals for rehabilitation were listed and costed for each part and for both banks. A three stage evaluation method was then used to prioritise the sites: environment and physical values; likelihood of success; and economic evaluation.

This poster displays the aerial photo and detail of one of the 31 sites. It shows the standard information taken at each site and the data collected for one site together with an analysis of that particular site, demonstrating the method.

The authors have also produced a similar management plan for the Liverpool Creek which lies to the south of the Johnstone River Basin and forms a separate catchment. The standard of this river management plan together with the one reported here for the South Johnstone River is such that any proposal for rehabilitation works on the North Johnstone can readily follow the principles developed without the necessity of preparing a strategic management plan for the North Johnstone River.

Ms Samantha Fox[1, 2] and Ms Caitlin Mitchell[2]
[1]School of Tropical Biology, James Cook University, Townsville
[2]Tropical Environment Studies and Geography Department, James Cook University, Townsville

Age estimation in spectacled flying-foxes

Spectacled flying-foxes (*Pteropus conspicillatus*) are one of four main species of flying-fox found in Australia and are listed as vulnerable under the federal EPBC act. A Conservation Plan and a Recovery Plan are currently being designed and implemented for this species, although the *Action Plan for Australian Bats* states that there is insufficient information on this species to adequately assess its' conservation status. One of the biggest debates surrounding the welfare of the spectacled flying-fox is whether or not this species is in decline or not. The fruit farmers who suffer crop losses due to marauding flying-foxes believe there are more than ever, while conservationists involved in the annual census believe the species is in serious trouble. One of the key factors unknown in the life history of the spectacled flying-fox is longevity in the wild. Determining this factor is important in understanding the potential for recovery in a declining species. Spectacled flying-fox females give birth and rear their first young successfully at the age of 3 years and only have a single young each year. If we know the average longevity for this species we can determine whether the potential rate of increase outweighs the mortality rate and therefore gives the species a chance of recovery. By working out a demographic profile for a population we can also determine whether there are any age groups which suffer higher than average mortality rates and try and establish why. Aging is achieved by measuring the accumulation of cementum layers around the root of the canine tooth. All teeth came from spectacled flying-foxes that had died from tick paralysis. 93% of individuals aged were 6 years or younger, however interpretation of this result is difficult with the sample being biased. Several possibilities are discussed.

Ms Katie Jones and Dr Andrew Krockenberger
School of Tropical Biology, James Cook University, Cairns

Dietary selectivity in a rainforest possum

Local temperature increases associated with global warming are expected to elevate the water requirements of the cool-adapted rainforest folivores. Folivores require moisture for evaporative cooling and processing plant toxins, but have limited access to water due to the highly toxic effects of plant secondary metabolites (PSMs) ingested as part of a leaf-based diet. Thus, the marsupial folivores face a serious problem; they must increase foliage intake to gain more water, but with this increased intake they will ingest higher levels of PSMs to detoxify and excrete. We are testing the effects of foliar PSM and water content on food choice by the regionally endemic *Pseudochirops archeri* (green ringtail possum), in a rainforest fragment of complex notophyll vine forest on fertile basalt soil. This tropical upland rainforest experiences a marked hot, dry season between about August and November, during which time folivores have little or no access to free water. Direct observation and faecal analysis indicate that *P. archeri* preferentially feeds on four rainforest tree species. *Aleurites rockinghamensis* is by far the favourite and has particularly high and constant foliar water content. Dietary selectivity is also occurring on an intraspecific basis, where *P. archeri* will strip the leaves from an individual tree but ignore a con-specific even when the foliage is intermingled in the canopy. This food preference may be based on intraspecific variation in foliar PSM content, which is the topic of further investigation. Data collected by continuously logging posture sensitive radio-collars suggests that *P. archeri* feed in one-hour bursts followed by equal periods inactivity. A longer continuous feeding period between 3am and 6am corresponds with maximum leaf water content predawn. Dietary selectivity in *P. archeri* is occurring at a plant species level and intraspecific level and varies on a temporal basis driven by foliar water content and perhaps an interaction with PSMs.

Ms Lynne Jones and Associate Professor Paul Gadek
School of Tropical Biology, James Cook University, Cairns

Restricted gene flow among populations of a rare rainforest tree, *Idiospermum australiense*

The rare and endemic tree *Idiospermum australiense* has a fragmented distribution in the lowland rainforests of north Queensland. The distances between populations vary. It produces a large toxic seed, which displays no obvious dispersal adaptations. Does the fragmented distribution and apparently limited seed dispersal ability of *I. australiense* translate to restrictions upon gene flow among populations? And if so, does the distance between populations determine the genetic structure among populations? Individuals from four populations were screened for polymorphism using a suite of dominant molecular markers. All four populations were found to be distinct from each other. However, distance alone did not adequately describe how the variation present was distributed between populations. The degree to which populations have become isolated from each other is likely to have been influenced by range of historical events. Additionally, this structure may be provided with reinforcement by a more localised standard means of seed dispersal.

Ms Anita Keir
School of Tropical Biology, James Cook University, Townsville

Birds in riparian remnants on cane farms

Remnant riparian vegetation on sugarcane farms may be extremely valuable to wildlife conservation since it often represents the only remaining fragments of a once-continuous habitat.
A study was designed to determine the effects of width of the riparian vegetation, as part of a larger project examining bird assemblages in riparian strips in a lowland cane-growing region near Tully in the Wet Tropics of North Queensland. Twelve areas of remnant vegetation of varying widths were surveyed, each on a separate stream 400 m from large blocks of source forest. Four riparian areas within source forest (i.e. not surrounded by sugarcane) were also surveyed as control sites.

Two bird censuses at each site were used to examine relationships between bird assemblages and width of the riparian zone, as well as structural features of the vegetation. Control sites had a distinct bird assemblage, demonstrating the need to retain large areas of forest for conservation of the avifauna. However, remnant riparian strips provided habitat for a wide range of bird species. Species richness increased with width of the riparian zone, with high richness at the wide sites due to them having a mixture of open-habitat species typical of narrower sites and rainforest species typical of control sites. Control sites had lower richness than all but the narrowest sites, due to them containing few open-habitat species. Richness of only rainforest species was similar for control and wide sites. A minimum width of 90 m was necessary to support most rainforest species. This study reinforces the importance of riparian strips for wildlife in an agricultural landscape, and highlights the potential for restoration of such strips to contribute to conservation on a regional scale by increasing available habitat and restoring landscape connectivity.

Ms Anna Koetz[1], Dr David Westcott[2] and Dr Bradley Congdon[1]
[1]School of Tropical Biology, James Cook University, Cairns,
[2]CSIRO Sustainable Ecosystems, Atherton

Song dialects in the Chowchilla – geographic variation in a cultural trait

In passerines, song is passed from one generation to the next through learning from conspecifics. This, by definition, classifies bird song as a cultural trait. The learning process often contains some degree of error and improvisation, which frequently leads to the production of intraspecific variation in song. Due to the important functions of bird song such divergence in song can potentially create and maintain pre-mating barriers to gene flow by favouring within-dialect mating and discouraging between-dialect dispersal, which may influence genetic divergence and speciation. In addition, processes such as mutation, drift, dispersal and selection have been shown to influence cultural evolution in similar ways to genetic evolution. However, the relative importance of these processes in general and of behaviour in particular in the isolation of populations and the formation of new species remains a major theoretical controversy in evolutionary biology.

The Chowchilla (*Orthonyx spaldingii*) is a highly vocal rainforest specialist bird endemic to the Wet Tropics region. Geographic variation in their song has previously been observed within small study areas. Limited evidence of variation across larger distances implied the presence of larger scale variation and divergence across the species' range. To clarify the causes, functions and consequences of this geographic variation, the first aim of this study is to establish the pattern and extent of geographic variation in Chowchilla song. So far, digital recordings from eight different sites within the Wet Tropics rainforest show striking differences in Chowchilla song both between, and to a lesser degree within, these sites.

Major differences occur in the number, type and order of song elements within the song, as well as in song length. It is thought that both vicariant isolation and isolation by distance may have caused such striking geographic variation, although forest type and/or population density may also influence song. Research is continuing into the mechanisms responsible for the origin of these differences.

Ms Marit Kragt [1] and Dr Peter Roebeling[2]
[1]Wageningen University and Research Centre, Wageningen, The Netherlands
[2]CSIRO Sustainable Ecosystems, Tropical Landscapes Program, Townsville

Valuing the Great Barrier Reef and the economic impact of reef degradation for marine based tourism

There is increasing evidence that the Great Barrier Reef (GBR) is threatened by sediment and nutrient run-off from catchments adjacent to the reef. This run-off affects the quality of the reef and, in turn, the economic sectors relying on healthy reef ecosystems, such as the fishery and the tourism industries. Although reef-related tourism (e.g. diving and snorkelling) is the second largest economic sector in the GBR Catchment, there is still limited information on the economic value of the Great Barrier Reef in general and on the likely economic impact of reef degradation on the tourism industry in particular. The objectives of this research are: i) to determine the non-use value tourists attach to the GBR using a Contingent Valuation approach, and ii) to determine the impact of reef degradation on tourist reef trip demand and expenditures using a Contingent Behaviour approach. Our results indicate that the willingness to pay to preserve the current reef quality is approximately A$25 per tourist per visit. Aggregated over all reef visitors this gives us a yearly GBR non-use value of A$42 million. Furthermore, our results show a more than 50% decrease in the demand for reef trips given a 70%, 85% and 90% decrease in fish diversity, coral cover and coral diversity, respectively. This corresponds to an annual decrease in marine based tourist expenditures of some A$134 million for the entire GBR.

Ms Tina Lawson
School of Tropical Environment Studies and Geography, James Cook University, Cairns

Fifty years of change in extent of riparian vegetation in the Mossman catchments

Mediating between water and land, riparian zones are amongst the most dynamic natural systems in the landscape. They are constantly undergoing change, induced by discharge regimes and disturbance events. As a result of such disturbance a more complex mosaic of landforms is created, in turn leading to the more complex and diverse biological communities found in these zones than in nearby areas. GIS and remote sensing techniques were used to assess the changes in the extent of riparian vegetation along the Mossman River, the South Mossman River and Cassowary Creek between 1944 and 2000. Aerial photographic datasets from 1944 and 2000 were used to document changes as GIS layers. The changes in riparian vegetation within these catchments can be attributed to anthropogenic activities or natural processes. Anthropogenic activities that have induced change in the extent of riparian vegetation in the study area include clearing for agricultural expansion and changes in farm management practices such as recent reductions in burning of cane prior to harvest. Losses due to clearing for agriculture total 66 ha, while gains through changes in farm management practices are 74 ha. Stream channel movement is a natural process that also influences the extent of vegetation along watercourses in the study area. Losses and gains due to stream channel movement total 22 ha and 45 ha respectively. Additionally, the vegetation in 48 ha has become denser due to fewer escaped cane fires burning the hillslopes. Changes in extent of riparian vegetation along any watercourse will impact directly on the quality and effectiveness of that zone as habitat for fauna. A method that identifies vegetation changes in the landscape and their causes, be they anthropogenic or natural, may lead to the application of more suitable land management practices and provide a basis for future planning.

Ms Tina Lawson
School of Tropical Environment Studies and Geography, James Cook University, Cairns

Can riparian zone quality be determined through aerial photographic interpretation and GIS analysis measuring canopy cover and width of woody vegetation?

Riparian zones mediate between terrestrial and aquatic ecosystems. They are associated with high water availability, nutrient-rich soils, high productivity, and thus exhibit greater plant and animal diversity than nearby areas. However, many riparian zones have been reduced in their functionality by humans for urban and rural land uses. Attributes of vegetation structure such as canopy cover, abundance of weeds and different life forms relate to site quality. This study examined canopy cover and width of woody vegetation in a desk analysis of 'quality' as surrogates for other 'quality' attributes such as abundance of weeds and debris and human disturbance. Canopy cover and width of riparian strip were both highly correlated to the other 'quality' attributes and therefore were deemed acceptable 'quality' indicators. To determine whether vegetation quality indicated high riparian habitat values, birds were used as indicators of species diversity. 'Quality' was found to be an adequate indicator of total bird species diversity, as well as diversity of rainforest dependants, insectivores, frugivores, and omnivores, along with species that prefer heights of >2m up to and including the canopy. Thus, habitat quality forms a satisfactory surrogate for diversity of riparian rainforest specialist birds. To establish whether GIS and aerial photography analysis be used as an accurate measure of riparian quality, comparisons of a desk assessment and field assessment of quality were made. These comparisons demonstrated that the desktop assessment was 78% successful in predicting the field quality, with a further 13% of differences being explained by obvious recent clearing or tree falls. Thus, with very recent aerial photography, the method would be expected to be successful in 91% of cases. A successful method of desktop habitat quality assessment for riparian zones can reduce resources required for assessment thus allowing larger-scale studies to provide a quick and efficient way of determining conservation values of riparian areas.

Miss Melinda Laidlaw
The University of Queensland, Brisbane

Does size (and shape) matter? Implications of the scale of observation of Australian subtropical rainforest

Vegetation patterns and their environmental correlates change with the scale of observation. The question of what plot size and shape are appropriate for use in vegetation surveys is as old at the trees themselves. An important initial step in most vegetation surveys is to determine the appropriate plot size and shape which will both achieve the research goals of the study and be achievable within financial and time constraints. This study aims to identify an appropriate plot scale which will capture an adequate sample of the vegetation community at a site and will allow the contribution of particular environmental gradients to be assessed.

A one hectare subtropical rainforest plot in Lamington National Park, Queensland, was used to investigate the implications of changing plot size and shape on the interpretation of the vegetation community and several associated environmental gradients within the region. The hectare was investigated as multiples of 10 x 10 m, 20 x 20m, 10 x 50m and 20 x 50m plots. Results showed that square 20 x 20m plots provided the best compromise between capturing information about the vegetation community and discretely identifying environmental variables associated with the vegetation. These plots are also simple to establish quickly and accurately using only two people and minimal equipment.

Dr Jin Li and Dr David W. Hilbert
Tropical Forest Research Centre
CSIRO Sustainable Ecosystems, Atherton

LIVES: A new predictive model for the distribution of species using presence-only data

A new predictive model, LIVES, is proposed to predict the distribution and potential habitat of species using the presence-only data. LIVES is compared with the existing predictive models like BIOCLIM, and DOMAIN. These models are applied to the spatial distribution data of Golden Bowerbird (*Prionodura newtonia*). The success of predictions of these models is assessed by correct classification rate and Kappa. LIVES is demonstrated to be a reliable predictive model.

Mr Chris Manning, Ms Sally Peut, Mr Andrew Tapsall,
Ms Kellie Lobb and Mr Jason Vains
Great Barrier Reef Marine Park Authority, Townsville

Reef water quality: our role in influencing change

Declining water quality is one of the major threats to the Great Barrier Reef. This decline is largely attributable to activities occurring in the coastal regions adjacent to the Great Barrier Reef. Since European settlement, there has been extensive land modification in the Great Barrier Reef Catchment to allow for urban development, intensive and extensive agriculture, aquaculture, mining and mineral processing, and other industrial activities. Consequently, there have been significant increases in sediments, nutrients and pesticides in rivers draining to the near shore regions of the Great Barrier Reef. These pollutants can promote algal growth, smother coral and seagrass communities and affect the health of seagrass and mangrove communities. They may also reduce the reproductive success and recruitment of corals, weaken coral structure and enhance the survival of predators such as the Crown of Thorn Starfish.

The Water Quality and Coastal Development group of the Great Barrier Reef Marine Park Authority works in partnership with all levels of government, industry and the community to identify and manage water quality issues by contributing to the development and implementation of strategies across the Great Barrier Reef Catchment. Successful implementation of these strategies will help ensure the long-term sustainability of the Great Barrier Reef Marine Park and the ecosystems, species and industries it supports.

This poster endeavors to describe the role of the Water Quality and Coastal Development group in identifying the water quality issues of concern, contributing to the development and implementation of management strategies and by helping to raise the awareness of water quality issues and their management among the wider community.

Ms Sharon Marks
Fitzroy Basin Association, Rockhampton

Central Queensland Healthy Waterways Partnership for community awareness

Partner organisations of the Fitzroy Basin Association and Coastal Cooperative Research Centre, representing government agencies, scientific institutions, universities, local councils, industry groups and NGOs, have developed a public awareness campaign in association with WIN TV Rockhampton.

The campaign's **first stage** (2002: 'public awareness') involved a series of television segments showing how organisations were addressing water quality, land erosion, river sediment and nutrient issues in the region.

The **second stage** (2003: 'public action') outlined ways for the community to improve the health and condition of waterways by reducing litter, removing weeds, planting trees, fishing responsibly, conducting research, educating students and joining catchment programs such as Landcare.

The **third stage** (2004: 'collaborative links') involved ongoing branding, industry sponsorships, community members promoting on-ground activities, and development of publications, an award scheme and displays. Each stage is evaluated on progress, effectiveness, community impact and mutual benefits.

All indicators since 2002 (surveys of catchment coordinators, resident surveys, community feedback, support by participating organisations, etc) demonstrate support for the public awareness campaign to continue. Other regional groups are now interested in taking up the Healthy Waterways campaign as an awareness communication tool in their area.

Dr Dave McJannet and Mr Mark Disher
CSIRO Land and Water, Atherton

Coastal forests: kidneys of the floodplains?

Before the expansion of agriculture into the Wet Tropics region, the coastal floodplains were covered by a mosaic of coastal forest types. Following heavy wet season rains, floods would recede leaving the surrounding forests inundated with sediment and nutrient rich water. Slowly, over time, the water on the floodplain would have either drained to wetlands and streams, or have been evaporated to the atmosphere. The floodplain forests acted like a giant regulating valve; slowing flows and gradually releasing them over time. Through this process the forests also acted liked giant kidneys; filtering out sediment and nutrient from the flood water before releasing them to the sea.

As the settlement of Australia's fertile coastal zone pushed slowly north, agriculture began to expand in the Wet Tropics region. The swampy floodplains were unsuitable for growing crops, hence, a massive effort was mounted to drain swamps and clear coastal forests, thereby, 'improving' the land and making it productive.

The agricultural systems we see today are designed to shed floodwaters as quickly as possible and as a result, sediments, agrichemicals and nutrients (all of which are thought to have detrimental effects on coral reefs in high concentrations) are now rapidly flushed to the sea.

With the realisation of the potential importance of these coastal forests and wetlands, increasing resources are being directed at reinstating some of the filtering and regulating capabilities of the floodplain. Strategic revegetation and wetland construction based on sound scientific knowledge is vital but there are still a number of questions we need to answer…

What factors control the mosaic of coastal vegetation?
What forest types are the best filters?
How much revegetation is needed to have the desired effect?
Where are the best places to put these forests?
What are the biogeochemical and hydrological processes that take place during inundation?

Mr Ed Oldmeadow and Ms Cassandra Chopping
Department of Natural Resources and Mines, Mackay

Towards the determination of a farm scale best management practice for the eradication of the noxious weed *Hymenachne amplexicaulis* in semi-tropical, freshwater wetlands, Mackay, Queensland

Collaborative research in the freshwater Sandringham Lagoon wetland (~150ha) between the Department of Natural Resources and Mines (NR&M), CANEGROWERS, the Pioneer Integrated Catchment Management Association (PICMA), the Mackay Area Productivity Services (MAPS) and the Mackay City Council focussed on developing a farm scale best management practice for the chemical eradication of the noxious weed *Hymenachne amplexicaulis*. The research was directed at farmers managing localised outbreaks of the weed in watercourses, similar in size and hydrologic character to Sandringham Lagoon. The research aimed to determine the optimum quantity of Hymenachne to target per spray event so as to eradicate the weed, without adversely affecting downstream water quality (i.e. depletion of dissolved oxygen and resultant fish kills). The chemical used was glyphosphate as it is readily available, economically priced and registered for use in fresh water wetlands.

The robust, highly persistent Hymenachne has recently (2004) been added to the Mackay City Councils list of high priority pests. Apart from the obvious economic problem associated with the spread of Hymenachne into cane-fields, the weed is notorious for it's impact upon water quality and fresh water ecology. In the Sandringham Lagoon wetland various states of Hymenachne infestation from <5% to 100% were observed in localised areas. In areas most heavily infested, light infiltration was almost totally impeded, dissolved oxygen concentrations were consistently low (<0.05mg/L) and biodiversity was severely decreased. Degraded environmental effects were less noticeable in areas with smaller infestations.

The research focussed on diurnal monitoring of physio-chemical water quality (dissolved oxygen concentration, pH, electrical conductivity and temperature) over a six month period. Monitoring occurred at a control site and three research sites. At each site different amounts of Hymenachne were targeted during individual spray events. The duration of the spraying regime, therefore, varied in accordance to the amount of weed sprayed during each episode. Throughout the spraying the effectiveness of kill and water quality was assessed. The project generated specific farm scale managerial outcomes for the effective eradication of *Hymenachne amplexicaulis*, whilst minimising deleterious downstream environmental consequences. This research is the first of its kind in the Mackay area and is hoped to assist future efforts in the effective control of the problematic, noxious weed in tropical and sub-tropical fresh water ecosystems.

Mr Trevor Parker, Dr Jin Li and Dr David Hilbert
CSIRO Sustainable Ecosystems
Tropical Forest Research Centre, Atherton

The affects of climate change on the abundance of the grey headed robin

Using a Generalised Linear Model and a Geographic Information System, the abundance of the grey headed robin was predicted and mapped for the Wet Tropics bioregion. The results clearly indicate climate change will significantly affect the abundance and spatial distribution of this species.

Mr Richard L. Pauku
School of Tropical Biology, James Cook University, Cairns

Participatory domestication of indigenous fruit trees in the Solomon Islands

In Solomon Islands subsistence agriculture, monoculture plantations, new settlements and commercial timber extraction have resulted in indiscriminative deforestation. Recently, it has been widely recognised that domestication of trees for agroforestry would contribute to the alleviation of these ecological and socio-economic problems in developing countries.

This poster describes a project to develop techniques for the domestication of two priority indigenous nut tree species (*Barringtonia procera* and *Inocarpus fagifer*) in the Solomon Islands, aimed at enabling farmers to cultivate them for income generation and improved livelihoods and, through agroforetry, to develop more sustainable agricultural production. The species priorities were identified through a participatory survey of households in five villages around Kolombangara Island. The project has also developed robust vegetative propagation protocols for village scale nurseries; quantitatively characterised the phenotypic variation in the dry matter portioning between different components of fruits and nuts; identify “ideotypes’ that maximises Harvest Index, and started to identify superior trees as potential cultivars for cultivation. These results indicate that the participatory domestication of indigenous nuts in the Solomon Islands could be implemented to allow local people to make better use of the natural resources. Thus could greatly enhance the opportunities to commercialise indigenous nuts.

Ms Catherine L. Pohlman, Associate Professor Stephen M. Turton and Dr Miriam W. Goosem
School of Tropical Environmental Studies and Geography, James Cook University, Cairns

Internal fragmentation in the rainforest: edge effects of highways, powerlines and watercourses on tropical rainforest understorey microclimate and vegetation structure.

Human activities have led to the loss and fragmentation of rainforest habitat around the world's tropics and sub-tropics. Additionally, internal fragmentation has subdivided remaining areas of rainforest, exacerbating the effects of the initial disturbance. Linear clearings for human infrastructure, including roads and powerlines, are widespread within the rainforests of the world and the Wet Tropics World Heritage Area of north-eastern Queensland in particular. Edge effects of these linear clearings have the potential to substantially increase the disturbed area within existing tracts of rainforest, potentially affecting a wide range of rainforest biota. We are investigating the impact of linear infrastructure clearings on the understorey microclimate of the adjacent rainforest. Increases in the penetration of light and wind into the rainforest understorey and resulting alterations in vapour pressure deficit, temperature and soil moisture may further alter the vegetation structure and regeneration dynamics of rainforest plant species near the edge. Edge effects in both microclimate and vegetation structure have been examined along highways and powerline clearings that pass through rainforest and compared with those along nearby watercourses (widespread natural canopy openings). Gradients in light availability, air temperature and vapour pressure deficit have been detected near the rainforest edge and the impacts of these gradients on vegetation structure and seedling dynamics near the edge are being investigated.

Ms Michaelie Pollard
School of Tropical Biology, James Cook University, Cairns

Influence of a natural light gradient on the macroinvertebrates of tropical streams

Benthic (bottom-dwelling) freshwater communities are influenced by riparian canopy cover because shade regulates instream primary productivity. Previous studies on the effect of light to benthic fauna have been limited by shade manipulation experiments and discrete classification. A continuous treatment of light has never been considered. In this study, macroinvertebrate communities were sampled from artificial substrata conditioned in stream riffles under a range of natural riparian shade conditions. Hemispherical photography of the riparian canopy was utilised to estimate percent canopy cover and photosynthetically active radiation (PAR) values. Non-metric multi-dimensional scaling was used to assess macroinvertebrate community response to PAR and other environmental variables. Light was found to have a major influence on the distribution patterns of fauna, although taxon-specific responses were differential. Communities were found to be stable over certain ranges of light intensity, however, two PAR transition windows were identified by multi-response permutation procedure, across which communities underwent fundamental change. Mean macroinvertebrate abundance increased across the lower transition window but not the higher one. Mean taxonomic richness appeared unaffected across these transitions, but changes within functional feeding guilds may best explain the MRPP result. The influence of light upon these communities was found to be coupled with the affect of discharge velocity, but also to act independently.

Dr Joelle Prange
Consortium for Integrated Resource Management (CIRM),
Department of Natural Resources and Mines, Townsville

Research and development needs in Great Barrier Reef catchments

The Reef Water Quality Protection Plan (RWQPP) is a joint initiative between the Australian and Queensland Governments to halt and reverse the decline in quality of the water entering the Reef. The Plan identifies actions, mechanism and partnerships to build on existing policies and initiatives to achieve this goal. Fundamental knowledge of biophysical, social and economic drivers is essential for effective natural resource management, thus science and knowledge of the Reef catchments underpins the RWQPP.

The Consortium for Integrated Resource Management (CIRM) has recently begun work to develop research priorities in the Reef catchments to support implementation of the RWQPP. This initiative is managed by a multi-institutional research group know as the CIRM Reef Catchments Working Group, with membership from Federal and State Governments, Regional NRM bodies, Universities and Research Institutes. The project will document current R&D activities within the Reef catchments, identify research and development gaps that currently exist, and then describe the research needs in the Great Barrier Reef Catchments to support the RWQPP. The purpose for this effort is to align the issues identified in the RWQPP and match these issues to the science research needs that ultimately drive the effective management of the Great Barrier Reef World Heritage Area. Furthermore this initiative will highlight and support collaboration amongst research providers for targeted science delivery to reduce the increasing threat of declining water quality in the catchments that drain into the Great Barrier Reef lagoon.

Ms Andrea Pullo, Associate Professor Paul Gadek, Dr Will Edwards and Mr Nigel Tucker
School of Tropical Biology, James Cook University, Cairns

Isolation and the soil seed bank: the effect of distance on soil seed bank composition of selected rehabilitated plots

Tropical forest rehabilitation in the Atherton Tableland of northeast Queensland has occurred adjacent to - and isolated from - intact forest. Isolation may reduce species diversity due to the lack of seed dispersers present in intact forests. In this study I describe the soil seed bank at sites of differing levels of isolation to investigate species diversity in relations to distance-dependent effects. The aim of this study was to determine how isolation from intact forest influences the soil seed bank composition of selected rehabilitated plots

I chose 17 sites: siix intact forest sties, six adjacent rehabilitated plots, and five isolated rehabilitated plots. I extracted 20 soil cores from each site. Seeds from soil germinated in glasshouse conditions for three months. Seedling identity, family, habit, seed size, dispersal mechanism, origin (native or exotic), and successional stage were recorded for each germinant in each sample.

Overall, species diversity and abundance was significantly lower in the intact forests than the isolated plots. Further, adjacent and isolated rehabilitated sites were dominated by small wind-dispersed species as well as early successional herb species, and were both significantly different from intact forests (e.g. one species, *Ageratum conyzoides* (Asteraceae)) was significantly greater in abundance in the isolated rehabilitated plots than the intact forest sites. My results demonstrated that the soil seed banks of isolated and adjacent rehabilitated sites both contained a high proportion of weedy species independent of distance from intact forest. Implications include longer weed management in and around the rehabilitated sites to minimize the abundance of undesirable species present.

Mr Thomas Rayner
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The trophic ecology of freshwater fishes of an Australian rainforest river

The seasonal flood cycle of tropical rivers causes a shift in food web structure and function. In response, freshwater fishes often show marked seasonality in dietary composition. The extensive research conducted overseas is not matched by Australian studies. This is unfortunate, because the unique evolutionary history of Australian fishes suggests that global paradigms may not apply here. I am currently testing the applicability of models of fish feeding developed internationally to Australian tropical freshwater fish communities. To date, one year of sampling has been completed in the Mulgrave River. The gut contents of over 1000 fish have been analysed. While community composition varies seasonally, strong guild structure is apparent (five guilds identified) and there appears to be little evidence of dietary shifts. It is thought that this may be due to the relatively low inter-annual flow variability in the Mulgrave River. The implication of these dynamics, particularly in the context of future global climate change, requires further investigation. Specifically, the development of a conceptual model of the trophic ecology, and associated aquatic food web, may provide valuable information for the management of Australian rainforest rivers and their catchments.

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Efficiency in Great Barrier Reef water pollution control: a case study for the Douglas Shire

Despite the lack of adequate economic evidence, water pollution from economic activities in Great Barrier Reef (GBR) catchments is often regarded excessive. This paper assesses optimal levels of water pollution control for reef protection, in a case study for the Douglas Shire. Shadow values of terrestrial (diffuse-source) water pollution and a wide variety of economic (use and non-use) values of the GBR are estimated and used in an optimal control approach to determine optimal levels of water quality. Results indicate that regionally optimal levels of water pollution are above current levels, indicating that increased water pollution can increase regional economic welfare. Globally optimal levels of water pollution are, however, below current levels, indicating that domestic and international compensation for beneficial spillovers can increase current global economic welfare.

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Pond apple seed longevity

Pond apple (*Annona glabra*) is a small tree invading tropical wetlands in Far North Queensland. Capable of producing over 11 million seeds per hectare pond apple was listed as a Weed of National Significance in 1999. A field experiment was initiated at South Johnstone in 2000 to investigate its seed longevity. Samples of 50 seeds were placed in 10 x 10 cm mesh bags, and positioned in the field in a completely randomised design at 0, 2 and 10cm below the soil surface, with 4 replicates for each depth. Exhumation times were at 3, 6, 9, 12, 24, 30 and 36 months. The results showed that after 12 months, less than three percent of the seeds remained viable - the remainder had either germinated or died in the field. A very small proportion (less than 0.5%) remained viable until around 30 months. No further field germination was observed. This is encouraging for land managers trying to control pond apple, as it shows that two years of sustained control efforts will see the original soil seed bank depleted. This, coupled with 2-3 more years of monitoring and controlling regrowth would make pond apple control achievable in many situations, dependent on no new seeds being re-introduced into the area by animals or water movement.

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Spectacled flying-foxes: solutions for management

Conservation management of the Spectacled Flying Fox (SFF) is one of the most pressing and contentious issues facing natural resource management in the Wet Tropics. Recognised as an important component of World Heritage values, and listed as Vulnerable under the EPBC Act, this species also causes significant damage to fruit crops and economic losses to individuals and industry in northern Queensland. Damage mitigation by means other than exclusion netting is of limited success, but exclusion netting is a prohibitively expensive solution for many growers. Our project aims to provide data this is needed to inform appropriate management. This requires sound knowledge of SFF i) population size, ii) roosting sites (camps), iii) foraging range and iv) seasonal behaviour. We have demonstrated that camp fly-out counts, used to estimate SFF population size since 1998, are sufficiently accurate to indicate numbers of flying foxes at individual camps, with a predictable observer underestimation averaging -20%. However, many SFF camps are seasonal, with animals only present in some months, and the proportion of the SFF population counted annually has not been known. This project is the first to attempt monthly counts at SFF roosts across the Wet Tropics. We are combining this effort with tracking individual SFFs using radiotelemetry and satellite technology. In this way our data is revealing simultaneous changes in camp size and camp switching by individual animals. To date, monthly counts have ranged from 65,000 to >140,000 SFFs indicating that we are not counting the same proportion of the population each month. The remaining challenge is to count the same, or a known, proportion of the SFF population each year. Our project is also working with stakeholders to encourage discussion and problem-solving in a regional flying fox forum, and collaborating with fruit growers to assess patterns of impact on orchards by SFFs.

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The role of a flagship species in the formation of ecological behaviours

Environmental agencies are increasingly using flagship species (those popular, relatively large, charismatic animals) as symbols for conservation. The goal is to motivate community members to take actions to conserve the flagship species and its habitat. However, there currently seems to be little knowledge suggesting the extent to which the *image* of a flagship can motivate people to engage in ecological (i.e. environmentally friendly) behaviours. A review of the literature on ecological behaviour formation suggests that such behaviour occurs when the issue is salient, an individual's cognitive and affective beliefs and attitudes, values and intentions are all directed towards the behaviour, and they feel personally responsible to take action. This study sought to determine whether the image of a platypus as a flagship species could influence these components of behaviour and change people's *intentions* to conserve the platypus' riparian habitat. Using a self-report questionnaire, this study aimed to determine: (1) what the platypus symbol meant to the 169 respondents; (2) whether an increased level of exposure to the platypus flagship enhanced the flagship's effectiveness in motivating intentions to behave; (3) whether a person's level of environmental consciousness (measured by environmental awareness, values, beliefs about environmental consequences, saliency, empathy, and responsibility) enhanced the flagship's effectiveness in motivating intentions to behave. A qualitative investigation of aim 1 indicates that the image of the platypus has a variety of meanings to different respondents. Preliminary correlation and regression analyses suggest that a higher level of exposure and level of environmental consciousness were more strongly correlated with a change in respondents' intentions. However, in both circumstances the regression analyses explained less than 5% of the variance. From a management perspective, this suggests that managers should be wary of relying strictly on the use of flagship species to change community members' intentions to behave.

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Biophysical impacts and psychosocial experiences associated with use of long-distance walking tracks in the Wet Tropics region of north Queensland

This research investigates the biophysical impacts and psychosocial experiences of visitors using two long-distance walking tracks within the Wet Tropics region. While some limited research has previously been conducted into visitor use of short, intensively hiked walking tracks in this region, no corresponding body of research exists for long-distance walking tracks. Data is being collected from both the Thorsborne Trail on Hinchinbrook Island and the Mt. Bartle Frere Walking Tracks in Wooroonooran National Park.

Biophysical impacts have been assessed at 100 sampling points along each track using rapid assessment methodology. Sampling points were stratified according to vegetation type and have been measured during both the wet and dry seasons of 2004. Biophysical impacts have been assessed using a range of indicators including estimates of ground cover composition within quadrats, track width, recording evidence of soil erosion, vegetation damage, littering, feral animals and weeds. Preliminary biophysical impact assessment results are presented.

Psychosocial data is being collected via a questionnaire completed by long-distance walkers using either track. The survey collects demographic information from hikers and asks them to appraise the natural, built and social environments associated with each track. Walkers are also asked to assess a range of potential management interventions and for their perceptions of the overall quality of their experience. In excess of 400 completed questionnaires have been returned to date but are yet to be analysed.

This project will enhance current theoretical understandings of human-environment interactions within a long-distance walking track context. It will also generate information about the impacts and experiences of walkers using long-distance tracks within the Wet Tropics region of direct relevance to track managers. Such information is critical if managers are to ensure both the future sustainability of walking tracks and the quality of long-distance walking experiences within tropical rainforest environments.