

Annual Report 2006

ARC Research Network



Discovering the past and present to shape the future:
networking environmental sciences for understanding
and managing Australian biodiversity
(Environmental Futures Network)



North Terrace Campus
Darling Building
South Australia 5005
Phone: + 61 08 8303 3952
Fax: + 61 08 8303 4364
Web: <http://nesuab.ees.adelaide.edu.au/page/default.asp?site=1>



Australian Government
Australian Research Council

Biodiversity



Climate change



Geo-history



TABLE OF CONTENTS

ABOUT THE NETWORK	1
OBJECTIVES AND RESEARCH PRIORITIES	1
GOVERNANCE	2
CONVENOR	2
RESEARCH ADVISORY GROUP	2
MANAGEMENT.....	2
COMMUNICATIONS GROUP	2
MEMBERSHIP.....	3
COMMUNICATION	3
NETWORK ACTIVITY IN 2006	4
FUNDING	4
WORKING PROJECT GROUPS (WGPs)	4
EARLY CAREER RESEARCHER (ECRs)	6
FINANCIAL STATEMENT	8
INCOME AND EXPENSES 2006.....	8
IN-KIND CONTRIBUTION	9
EXPENDITURE BY CATEGORY (%).....	9
FUNDED PROJECT REPORTS	11
PROGRESS AND OUTCOMES	11
PROJECTS THAT EXPERIENCED DEFERRED/DELAYED STARTS:.....	35
STRATEGIES FOR 2007	36
REGISTER OF RESEARCH NETWORK PARTICIPANTS - ATTACHMENT 1	40
NAMES OF PARTICIPANTS IN FUNDED WORKING GROUPS PROJECTS - ATTACHMENT 2	49
WEBSITE STATISTICS – ATTACHMENT 3	55

Objectives and research priorities

This ARC research network was funded in 2004 to provide the mechanism for researchers from widespread disciplines to come together to discuss the major factors impacting on Australian biodiversity (past, present and future) and to plan innovative, multidisciplinary research projects to inform researchers, resource managers and the general public of the consequences of those impacts.

Objective 1

Identify how best to describe Australia's current biodiversity and its biological and environmental history leading to the present

Strategies

The network has adopted a funding model to facilitate researchers getting together to discuss the major processes and impacts on Australian biodiversity and to identify, initiate and implement innovative, multi-disciplinary research projects.

Objective 2

Predict impact of environmental change on biodiversity to inform management decisions

Strategies

Relate to researchers and land managers to inform research direction and apply research findings

Research Priorities

Questions of particular interest in shaping the research priorities of the network include:

- How did Australia's terrestrial and freshwater biota respond to the Great Australian aridification?
- What has been the impact of *Homo sapiens* on the Australian continent? How has this impact differed between terrestrial, freshwater and marine environments, and why?
- How diverse is Australia's invertebrate fauna, what are the invertebrate 'hotspots' and how should they be managed? (similarly for other groups of organisms)
- What are the dynamics of extinction in Australia? When were the periods of elevated extinction, what caused these and what traits of species effect extinction risk?
- When did the extant lineages of our biota diversify and why?
- What determines species distribution and how will climate change impact on distribution?

The Network is dealing effectively with providing research strategies to address these questions. Progress varies among the groups that have been funded, but in general we believe that the core aim of the Network, bringing together novel, multidisciplinary groups to plan major new research initiatives, is working very effectively.

Convenor

Professor Bob Hill, Executive Dean, Faculty of Sciences, University of Adelaide, is the convenor of the ARC Research Network for Understanding and Managing Australian Biodiversity.

Research Advisory Group

The advisory group (also referred to as the Executive Management Committee) provides guidance and advice to the Network Convenor regarding the development of the research program. Members are as follows:



Professor Bob Hill
The University of Adelaide
Faculty of Sciences
North Terrace Campus
South Australia 5005



A/Professor Sean Connolly
James Cook University
School of Marine &
Tropical Biology
Townsville QLD 4811



Professor Andy Austin
The University of Adelaide
School of Earth &
Environmental Sciences
North Terrace Campus
South Australia 5005



Professor Steve Donnellan
Evolutionary Biology Unit
South Australian Museum
North Terrace
Adelaide 5000



Professor Arthur Georges
University of Canberra
School of Resource,
Environmental & Heritage
Sciences
Canberra ACT 260



Dr Simon Haberle
Australian National University
Department of Archaeology &
Natural History
Canberra ACT 0200

Management

The Network Convenor, Bob Hill, meets regularly with the Network Administrator, Ms Maria Lekis, to discuss day-to-day running matters. Dr Jackie Venning continued to provide in-kind support to the Network during 2006 as consultant. The executive management committee met quarterly in 2006 and discussed the following major items: Budget; calls for funding; assessment of applications; AGMs; performance targets; and Website operation.

Communications Group

Communication with Network members has to date been managed by the Management Team. However, as the working groups start to produce results it is intended that the chief investigators with specialist communication skills will be asked to join this group to promote the research outcomes.

Membership

The network has increased its membership during the year mainly through the successful application of Early Career Researcher and Working Group Project grants and several new registered participants via the website (approximately 30 new members in 2006/2007). A list of Network members is provided in Attachment 1.

Communication

The Network's website is the primary vehicle for communication. Members are advised by email when notices of particular interest, eg news announcements, calls for grant applications, are posted on the website. The research network website can be accessed at: <http://nesuab.ees.adelaide.edu.au/page/default.asp?site=1>



In September 2006 the Executive Management Committee undertook a review of the Website. Some changes were subsequently made to align the website with the current working model of the Network. These were carried out by Kojo Interactive, the host designers and the site is currently being updated by the Network Administrator.

At the completion of the website remodelling, the Network will undertake a survey of its members to determine the website's effectiveness.

For Website statistics, refer to Attachment 3.

Funding

The Network is now entering its third year of operation and to date approximately 62% of the Network's ARC funding has been committed to funding projects centred around the themes of the Network - impact on biodiversity of global climate change, past and future, geo-historical processes, and human arrival. This funding supports thirteen current Working Group Projects (WGP) that work to bring scientists from around the world to engage in multi-disciplinary projects to address the above themes. In addition, the Network has, to date, supported twenty-five Early Career Researcher (ECR) projects intended to equip candidates with multidisciplinary aspects of training in their respective research area. In 2006, the Network supported funding to the total value of \$415,320 toward these schemes.

Much of the funding provided to working groups has been in the form of a first cycle of funding, with options for up to two further cycles of funding, pending satisfactory progress reports. This allows for the funding of high risk projects while minimising the financial impact of failures. To date, progress on all working groups that have completed their first cycle has been very good, and in some cases genuinely outstanding. It is very encouraging that all projects that have multiple cycle funding have so far very easily passed the requirements for subsequent funding.

Working Project Groups (WGP)

A second round of funding was called late 2005 with announcements made in May of 2006. This round yielded a total of five applications and four were fully funded. The fifth application was refined and re-submitted, but later joined with one of the other successful applications submitted within this round. Total funding approx \$144 000, contingent on successful outcomes for subsequent years of funding.

	Chief Applicant (s)	Institution	Project Title	Amount funded
Round 2	Prof David Bowman	University of Tasmania, School for Environmental Research (ex Charles Darwin University)	Integrating historical, ecological, molecular and geographic data to reconcile Australian Biotic radiations - using eucalypts and song birds as a case study	\$20,254
	Prof Jim Bowler & Dr Matt Cupper Prof Tim Murray	University of Melbourne La Trobe University	Human-land interactions of Australia's earliest inhabitants: adaptation and impact	\$30,000
	Prof Jim Bowler, Prof Mike Sandiford, Prof Ian Simmonds & Prof Andrew Gleadon	University of Melbourne	Relief v Antarctic ice: passive or active drivers of Cenozoic climatic change	\$5,000
	Dr Margaret Byrne	CALM		
	Dr David Yeates David Bowman Dorothy Steane	CSIRO University of Tasmania University of Tasmania	Evolutionary history of the Australian biota - this project is tightly linked with the Methodological advances essential project	\$88,290
			Total Commitment	\$ 143,544

Round 3 funding was called in August 2006 with announcements made in November. A total of four applications were submitted to the Network and three were fully funded. The fourth application was deemed ineligible. Total funding approved approximately \$200,000 contingent on successful outcomes for subsequent years of funding.

	Chief Applicant (s)	Institution	Project Title	Amount funded
Round 3	Prof Steve Donnellan	South Australian Museum	Role of Melanesia in the diversification of the Australian terrestrial biota	\$58,754
	Prof Arthur Georges & Dr Ken Aplin,	University of Canberra CSIRO Sustainable Ecosystems		
	Dr Steve Cooper	South Australian Museum	Evolution of short-range endemic taxa associated with troglobitic and groundwater ecosystems	\$75,200
	Prof Andy Austin & Bill Humphreys	University of Adelaide Western Australian Museum		
A/Prof David Paton	University of Adelaide			
Prof Bob Hill	University of Adelaide	Habitat reconstruction and restoration: securing biodiversity assets in the face of climate change	\$64,950	
Prof Andrew Lowe	Dept for Environment and Heritage			
			Total commitment	\$ 198,904

Early Career Researcher (ECRs)

The Early Career Researcher (ECR) Program was set up to help young researchers in the early stages of their careers and PhD students to undertake various types of training in areas themed around the Environmental Futures Network. For the purposes of this program an ECR was defined as someone who had been less than 5 years post PhD. Activities supported included:

- Visits to research laboratories in Australia or overseas to learn new techniques, broaden research perspectives, and/or collaborate with Network member and other partners on projects that will directly contribute to the applicant's research, generally contribute to furthering their careers, and make a contribution to research covered by the Network.
- Attend training courses or workshops in Australia or overseas that would directly contribute to broadening the applicant's research perspectives, generally contribute to furthering their careers, and make a contribution to research covered by the Network.
- Organising a training workshop in Australia for other ECRs, postgraduates, and research staff in a specific area. Under this activity, consideration was given to funding experts from Australia or overseas that would be involved in the workshop..
- Any other proposal that could be interpreted as broadening the research experience of an ECR in a manner that is compatible with the goals of the Network.

Activities that were specifically excluded from the program included conference attendance as the primary aim of the application (although in some cases, piggy-backing conference attendance on a research visit was considered), fieldwork, and direct research costs.

Applications have been called for in March for activities in July-December, and November for activities in January to June 07. Maximum funds available were \$1500 for research visits/training courses in Australia, \$3500 for research visits/training courses overseas, and \$15,000 for organising and running a training workshop in Australia. The Network received eight applications in round two of which seven were funded, one project was later withdrawn due to personal commitments and funding returned.

In the third call, thirteen applications were submitted and ten fully funded. Two applications were deemed ineligible and the third application was rejected on the basis that funding was requested for a PhD scholarship of which the ECR scheme does not support. Total ECR funding in 2006 approximately \$73,000.

Applicant (s)	Institution	Project Title	Amount funded
Michael Schmidt Postdoctoral Research Fellow	CSIRO, Canberra	Attend a summer school workshop for Monitoring & Modelling Earth Systems	\$3,365
Aaron Camens, PhD Candidate	University of Adelaide, School of Earth & Environmental Sciences	Research visit to Vera Weisbecker laboratory, University of NSW	\$731
Ben Phillips, ARC Postdoctoral Fellow	University of Sydney, School of Biological Sciences	The evolution of dispersal in range-shifting populations	\$3,500
Nick Stevens*, PhD Candidate	University of Adelaide, School of Earth & Environmental Sciences	Systematics and biogeography of a major group of Australian parasitic wasps (Hymenoptera) associated with lepidopteran larvae	\$3,500
Hedley Grantham, PhD Candidate	University of Queensland, Ecology Centre	Research visit to South Africa to learn ecological patterns & conservation planning	\$3,500
Matthew Prebble, Research Fellow & Cassandra Rowe, Postdoctoral Research Fellow	The Australian National University, Dept of Archaeology & Natural History	A multidisciplinary workshop for defining plant extinctions from island Oceania. (Includes a supplementary value of \$875.00 applied for in 2007)	\$15,126
Rajkumar Radd, ARC Postdoctoral Research Fellow	University of Sydney, School of Biological Sciences	Training in molecular techniques for sex identification in reptiles	\$1,800
Total			\$ 31, 522

Round 2

	Applicant (s)	Institution	Project Title	Amount funded
Round 3	Amanda Lane, PhD Candidate	University of Sydney, School of Biological Sciences	Genetic Diversity in a Fragmented Habitat: Laticaudid Sea-kraits as a Model System	\$1,300
	Angus MacGregor, PhD Candidate	University of Adelaide, School of Geographical & Environmental Studies	Training course: <i>Analysis of Environmental Data</i> (Adelaide Jan 2007)	\$1,500
	Christine Lambkin, Biodiversity Curator Nick Murphy, Postdoctoral Fellow & Michelle Guzik, Postdoctoral Fellow	QLD Museum (Entomology) University of Adelaide, School of Earth & Environmental Sciences	Methodological advances essential for understanding the recent history of the Australian terrestrial Biota: "Molecular Dates and Rates Workshop"	\$19,600
	Fabien Aubret, ARC Postdoctoral Research Fellow	University of Sydney, School of Biological Sciences	Research visit to Prof Jean Clobert's laboratory(France):tutoring in theory and application of mathematical models to explore phenotypic plasticity in animal populations	\$2,500
	Ariella Helfgott, PhD Candidate	University of Adelaide, School of Mathematical Sciences	Research visit to Sean Connolly & Andrew Baird at James Cook University	\$1,100
	Nic Rawlence, PhD Candidate	University of Adelaide, School of Earth & Environmental Sciences	Ancient DNA records of the environmental impact of climate change and humans on Australian megafauna	\$3,500
	Lachlan Farrington, Research Associate	University of Adelaide, School of Earth & Environmental Sciences	Travel funding for attending an International workshop: conservation management and research in orchids	\$3,500
	Michael Jensen, PhD Candidate	University of Canberra, Institute of Applied Ecology	Development and application of novel genetic markers to address issues of marine turtle conservation	\$3,500
	Renate Faast	University of Adelaide	Travel funding to attend workshop on Orchid Population Dynamics	\$3,500
	Geoff While, PhD Candidate	University of Tasmania, School of Zoology	Assessing the social and genetic architecture in <i>Egernia whitii</i>	\$1,350
Total				\$ 41,350

* Withdrew funding due to personal commitments after it was awarded

Income and Expenses 2006

ARC Research Network name	Discovering the past and present to shape the future: Networking environmental sciences for understanding and managing Australian biodiversity
----------------------------------	--

Administering Organisation	The University of Adelaide
-----------------------------------	----------------------------

Income

Opening balance		\$ 379,318.46
ARC Funding		\$ 312,120.00
Contributing Organisations	Cash	\$ 99,000.00
Australian National University	\$ 4,000	
Charles Darwin University	\$ 4,000	
CSIRO	\$ 5,000	
Massey University	\$12,000	
South Australian Museum	\$10,000	
Southern Cross University	\$10,000	
University of Canberra	\$10,000	
University of Sydney	\$20,000	
University of Tasmania	\$ 4,000	
University of Wollongong	\$10,000	
University of Adelaide	\$10,000	
	\$99,000.00	
Total Income		\$ 411,120.00

Expenditure

Salaries (includes on-costs)		
The Network Administrator		\$ 58,606.31
Specialists / Consultants *		\$ 47,968.03
Funding		
Working Group Projects #		\$ 160,309.58
Early Career Researcher #		\$ 31,578.82
Web / IT/Communications		\$ 4,021.68
Travel (Intl./Domestic/Vehicle)		\$ 7,566.20
Conferences		\$ 1,666.27
Stationery		\$ 185.94
Other		\$ 1,264.86
Total Expenditure		\$ 313,167.69
Closing Balance^		\$ 378,270.77

Not all CIs invoiced the Network for their funding in 2006

*Expense (in total) to be recovered in 2007, incorrectly billed to grant

^ Please refer to carry over (forward commitment) statement p9

In-kind contribution

The In-kind contribution to the Network in 2006 is recognised as participation, administration, and official duty capacity and calculated as follows:

Management Committee efforts during the year, an estimated 5% of their time;
 average salary of management committee staff @ \$140,000 x 5% = \$7,000 x 6 members = \$42,000

CI(s) of each working group project (grant writing, submit reports, communication, workshop & invoicing to Network).
 average salary of CI staff @ \$100,000 x 3% = 3,000 x 13 CIs = \$39,000

Network office: space 10 square metres at City rental property (estimated) \$1,500 per square meter per annum = \$15,000. On-cost of Administrator Office for infrastructure use 1.54 % of gross salary = \$693

Members participation:
 Network members and ECRs participating in workshops, training sessions, (estimated) 2% of average PhD scholarship (\$20,000) x 50 = \$ 20,000.

Dr Jackie Venning offered 10% of in-kind support to the Network during 2006 as a consultant = \$10,000
 A further in-kind contribution is added to attend AGMs (no AGMs in 2006) = nil

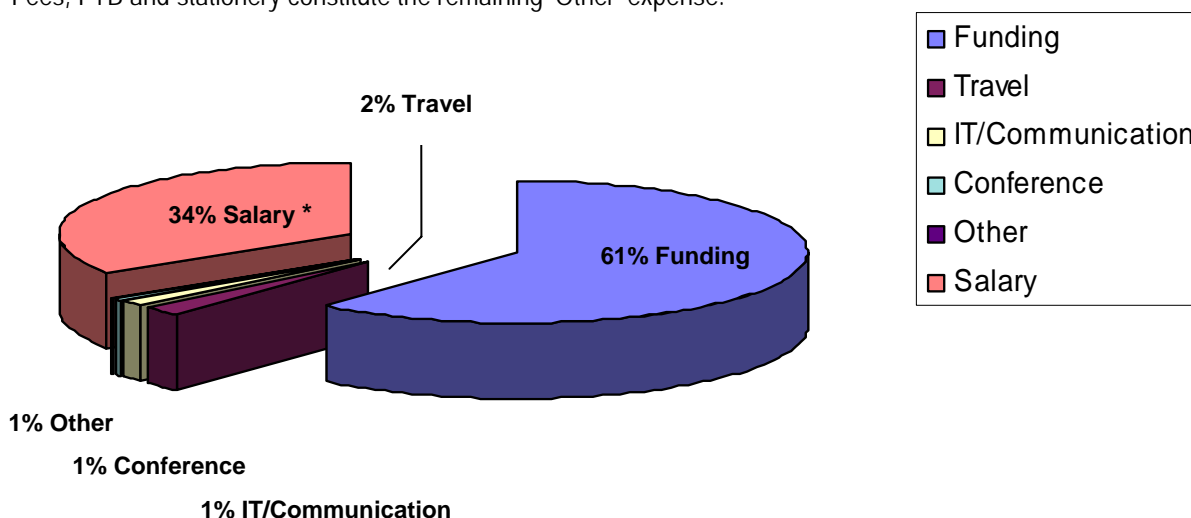
Total in-kind contribution (42,000 + 39,000 + 15,693 + 20,000 + 10,000) = \$ 126,693

Expenditure by Category (%)

In 2006, the travel and/or conference component is attributed toward the attendance of funded project workshops and/or the attendance of Executive Management Committee meetings held in Adelaide.

An AGM was originally scheduled for September of 2006, but was delayed until mid January 2007 to coincide with an international conference in Adelaide. As several members of the Network were to attend this conference it was a feasible alternative to maximise attendance. No AGM was held in 2006.

Fees, FTB and stationery constitute the remaining 'Other' expense.



* should reflect 18.1%; 15.9% to be recovered in 2007, incorrectly billed to grant

Difficulties experienced during this reporting period included compliance by a few collaborating institutions to sign-off the 'Agreement to Manage the Network' pro-forma being overdue in addition to late payment of invoices. Some Working Group Projects have experienced project delayed starts or deferred projects from 2006 to 2007 impacting on progress reports.

Provide the reason for carryover in the column below:

It is essential that reasons be provided by carryover requests

- (1) Late Invoicing and payment.
- (2) Deferred starts of two funded projects due to other commitments.
- (3) One funded project withdrew after it was awarded and money recovered back to the Network.
- (4) Forward commitment: the Network has committed to 13 Working Group Projects that operate on a 3 year basis contingent on satisfactory yearly outputs. This constitutes a considerable portion of money not yet spent but committed to. In dollar value this is a total of approximately \$820,000 for the fully funded projects, of which \$333,000 has been invoiced to date, with the remaining \$487,000 allocated to continued support for the life cycle of the projects.

It is the responsibility of the Research Network to ensure that the carryover amount requested in this document has been discussed with the Administering Organisation's Research Office and that it is consistent with the carryover amount, which is forwarded electronically, and in hard copy, to the ARC in a separate End of Year Report.

Research Network Convenor or Delegate:

Signature: _____

Date: _____ 28 March 2007 _____

Progress and Outcomes

The major outcome of the Research Network to date has been that several large, multi-disciplinary groups have met to discuss new approaches to the major questions that were posed in the initial application. Each of these groups has reported in writing and, in most cases at the Annual General Meetings of the Research Network. In many cases progress has exceeded our expectations and we are confident that by the end of the full funding cycle for these working groups we will see the outcomes indicated in the application, most notably an increase in the scale and focus of the nominated research activities. Many participants agree that the scale and focus being achieved would not have been possible, or even planned, without the input of the Research Network. The major advance achieved by the Research Network has been an increase in research breadth and capacity, it is more difficult to identify ways in which we have removed impediments to research, other than by allowing researchers to get together in the same physical location, where progress is often much swifter than is achieved by remote communication. We are beginning to see the first signs of grant applications on a major scale as a result of this Network (in particular CERF and NCRIS). We should be able to give a better indication of progress in our next annual report.

The working groups have been primarily composed of Australian-based researchers, but people have been brought in on a regular basis, both to contribute to working groups and to present to workshops for experienced researchers and, in particular, for early career researchers. In most instances, the workshops are taking full account of international trends in research, and the level of engagement with international best practice in research is evident. A register of participants in active projects can be found in Attachment 2 illustrating the comprehensive multidisciplinary mix and collaboration existing within the Network's scheme.

The governance of the Network has taken some time to become as effective as it currently is. The Management Committee meets regularly, has clear conflict of interest guidelines, and receives few complaints about the way it is dealing with the funding of research planning activities. The annual general meetings are robust, and we use a professional facilitator to run them. It is difficult to separate the business of the Research Network from the desire of participants to engage in research networking during the AGM. While this is a healthy sign, the Management Committee works hard to ensure that all necessary business is covered during each AGM.

The Network has not yet effectively engaged with end-users, in this case the various forms of land managers in Australia. We have this firmly on our future agenda, but to date there has not been enough concrete research progress to make this worthwhile. We are tentatively planning for a future meeting involving selected land managers to discuss our progress to date.

Following are progress and final reports from the various funded projects.

ERC Round 1	Applicant(s)	Kate Muirhead
	Project Category:	Research visit
	Project title:	Coevolution of the <i>Cotesia flavipes</i> complex and their polydnviruses: toward the effective control of stemborers in Australia
	Funding awarded:	\$ 3,500

Background

Kate visited Dr Jim Whitfield's laboratory at the University of Illinois at Urbana-Champaign and attended the Evolution 2006 Conference in Stony Brook, New York, to learn about the latest methods and analyses in the study of coevolution. These skills will be used in her PhD project to investigate coevolution of the *Cotesia flavipes* parasitic wasp complex and their polydnviruses (PDVs).

Project Description

Jim Whitfield is one of the world's leading investigators on the evolution of endoparasitism in braconid wasps. Travel to his laboratory for two weeks gave Kate the opportunity to interact and collaborate with other students and research scientists working on similar species and to broaden her knowledge on the coevolution of *Cotesia* and their PDVs.

At the Coevolution Symposium Kate gave a presentation on her PhD research into the *Cotesia flavipes* complex and their polydnviruses. She received positive feedback on her presentation and also some useful advice concerning her project. The conference gave her the opportunity to meet and discuss her research with a number of scientists using new analysis methods.

Outcomes

There were five outcomes:

1. Kevin Johnson, a leading researcher on coevolution of birds and lice at the Illinois Natural History Survey, provided Kate with some coevolution papers discussing current techniques and showed her how to use the coevolution analyses programs TreeMap 1 & 2, Treefitter and a data-based parsimony method that he has developed.
2. Josephine Rodriguez, a PhD student working on *Cotesia*, showed her a method to dissect insect genitalia in preparation for the SEM, which is an important component of her project for identification purposes.
3. Kate gave a presentation on her work and received some helpful feedback at a roundtable discussion with Jim Whitfield, Sydney Cameron and their students on current methods and analyses being used in ecology and molecular biosystematics.
4. Learning about programs used in molecular systematics and molecular clock analysis, such as SplitsTree and Rates.
5. Jim provided samples from his collection that will be useful for her PhD

Expenditure

Travel (International)	\$2,500
Accommodation	<u>\$1,000</u>
Total	\$3,500

ERC Round 1	Applicant(s)	Susan Cameron and Rob Waterworth
	Project Category:	Training Workshop
	Project title:	Multidisciplinary training workshop for the integration of biodiversity modeling, environmental data, phylogenetic diversity, and carbon accounting
	Funding awarded:	\$15,000

Background

The workshop was held 6-7 June 2006 at the Australia Museum in Sydney. Ten Early Career Researchers participated, including the co-PIs. The workshop was held in conjunction with a larger EFN working group meeting (2010 working group, Faith and Ferrier). Four 'mentors' from the 2010 Working Group attended the ECR workshop.

Project Description

As most participants were not familiar with one another or with the EFN (as stated in the proposal), a large part of the first day was spent with introductions and brief research presentations designed to generate group discussion. Dan Faith introduced the EFN and the 2010 Working Group and Rob Waterworth and Susan Cameron presented goals for the meeting and questions to consider. Each participant gave a 20 minute research presentation of their research as it applied to the workshop themes and discussion followed.

The second day was more focused, with demonstrations and hands-on training of several biodiversity measuring and monitoring tools, including the Biodiversity Analysis tool (Dan Rosauer, CSIRO/DEH), the National Carbon Accounting System (Rob Waterworth, Australian Greenhouse Organisation), Environmental Diversity software (Faith) and Generalised Dissimilarity Modelling (Cameron). Several breakout sessions were conducted on topics such as 'Monitoring biodiversity: What are we measuring and what does it tell us' and 'integrating carbon accounting and biodiversity protection'. These discussions provided the participants with the opportunity to discuss synergies within their different disciplines and potential research collaborations.

Some synergies identified included :

- Linking biodiversity priority setting with analysis of environmental change
- Phylogenetic analyses at multiple scales
- Linking climate change, biodiversity and landcover change

Outcomes

The workshop met the goals stated in the original proposal including sharing research ideas across disciplines and providing links to the 2010 EFN Working Group. All participants (with exception of Moffett, Kelley, and Armour) also attended the 2010 EFN meeting held over the following two days, 8-9 June 2006

Expenditure

Travel	\$ 6,520
Accommodation	\$ 4,650
Venue hire	free
Meals	\$ 1,734
Sundries	<u>\$ 250</u>
Total	\$13,154

ERC Round 1	Applicant(s)	Tobias Uller
	Project Category:	Workshop
	Project title:	Sex Allocation in Reptiles: Ecology, Evolution and Conservation
	Funding awarded:	\$ 3,600 plus an additional \$2,700 supplementary

Background

The workshop on sex allocation in reptiles brought together national and international experts in evolutionary ecology, sex determination and herpetology. The workshop intended to stimulate development of sex allocation biology using reptilian model systems and to integrate sex allocation research with recent theoretical and empirical advances in studies of sex determination. In addition, it aimed to promote collaborations between universities and research groups with different research of taxonomic background. This was further facilitated by Australia's leading role in sex allocation and sex determination research.

Project Description

Invited plenary talks focused on broad conceptual issues and the current state of sex allocation research, whereas additional speakers were free to present novel empirical work from their own laboratory. The main areas that were covered were costs and constraints on differential sex allocation, relationships between sex allocation and sex determination, and consequences of global climate change for species with temperature-dependent sex determination.

Main Presentations

Prof. Jan Komdeur	Avian sex allocation: mechanisms and fitness consequences
Prof. Andrew Cockburn	Chasing sex allocation in complex vertebrate societies - are we missing the point/s?
Prof. Arthur Georges	Sex determination and sex allocation
Dr Ido Pen	Modeling evolutionary transitions between GSD and TSD
Dr Erik Wapstra	Sex allocation in squamates: does the story become clearer with more data?
Dr Tobias Uller	Constraints on differential sex allocation

Outcomes

The workshop successfully managed to create a forum for exchange of ideas, model systems and results in sex allocation biology as evident from the positive response from attendees and other colleagues, both national and international. New collaborations were established between a number of research groups at different universities, including University of Groningen (the Netherlands), University of Wollongong, University of Sydney, University of Canberra and University of Tasmania. The support for making this meeting a recurring event has been very strong and future meetings are already being planned. The main conclusions can be summarized as follows:

- Reptilian model systems provide an excellent opportunity to test current theoretical models in a way that is not possible in most other vertebrate systems
- Recent studies in reptilian sex allocation has provided novel insights into the processes and mechanisms of sex determination and sex allocation
- Integration of proximate mechanisms of sex determination and sex allocation will transform the field, both theoretically and empirically
- Recent results on lizards suggest that our current understanding of the evolution of sex determination must be revised
- Climate change influences sex ratios at birth in species with temperature-dependent sex determination and may have consequences for population demography and population persistence

The workshop resulted in a research synopsis that was submitted for publication in the leading review journal *Trends in Ecology and Evolution*.

Expenditure

Travel (international)	\$1,985
Accommodation	\$ 506
Catering	<u>\$1,942</u>
Total	\$4,433 and \$2,700 as supplementary

ERC Round 1	Applicant(s)	Conrad Hoskin
	Project Category:	Research visit
	Project title:	The origin and future of <i>Cophixalus</i> frog diversity of Australia's wet tropic rainforests
	Funding awarded:	\$ 3, 500

Background

The purpose of the research visit was to work with Prof Craig Moritz and his research group to resolve the systematics and evolution of the *Cophixalus* frogs of the Wet Tropics rainforests of north-east Queensland. This research aims to understand the origin of the exceptional *Cophixalus* diversity seen in the rainforest of the Wet Tropics, through an analysis of diversity at all scales from the genus as a whole, through lineages within species, and down to divergence between populations across environmental gradients. This research is important for elucidating the processes driving diversification and for understanding the impact of global climate change on Wet Tropics diversity in the past and present.

Project Description

The research visit was conducted at the Museum of Vertebrate Zoology, which is part of the University of California, Berkeley campus. Conrad was primarily working with Prof. Craig Moritz (Director of the Museum of Vertebrate Zoology). Additionally, he was collaborating on the project with a member of his research group, Mrs Maria Tonione, and also with Assoc. Prof. Catherine Graham at the State University of New York, Stony Brook. He also interacted with other members of Prof. Moritz's research group as well as other researchers in the Museum of Vertebrate Zoology. Funding was organised through the School of Integrative Biology at the University of Queensland, where he recently completed his PhD.

The opportunity arose while at UC Berkeley to assess genetic variation in a frog parasite of the Wet Tropics. His PhD research was on genetic and phenotypic variation and secondary contact in the Green-eyed Tree frog *Litoria genimaculata*. This frog is parasitised by the larva of a Diptera of the genus *Batrachomyia*. He has long been interested in assessing genetic population structuring in this parasite to see if it matches that of its host. He was able to achieve this while at UC Berkeley and successfully sequenced the same mtDNA gene in the parasite formerly sequenced in the frog.

Conrad also had the opportunity to assess chytridiomycosis prevalence in the frog hybrid zone studied during his PhD.

Outcomes

He acquired a number of new skills while at UC Berkeley. He learnt several new laboratory techniques including a new DNA extraction method, a new PCR clean-up method, how to run a capillary sequencer, real-time PCR, and parasite genetic analysis. He also learnt a range of new techniques for the analysis of genetic data. In particular he acquired skills in the management and analysis of large genetic data-sets, how to resolve and score nuclear sequence data, programs for the analysis of genetic structuring and hybrid zone analysis (Bayesian Analysis of Population Structure - 'BAPS 4', 'Structure', 'Arlequin', 'NewHybrid'), analyses of environmental divergence between lineages and environmental niche modelling, and the analysis of chytrid prevalence data.

The research visit was highly successful in achieving the goal of understanding evolution of the Wet Tropics *Cophixalus* frogs, and also for conducting other research on Wet Tropics frogs. The greatest success was obtaining a very large and informative genetic data set for the analysis of phylogeographic structuring and secondary contact between lineages within *Cophixalus ornatus*.

The enclosed photo shows a male *Cophixalus ornatus* calling from the trunk of a tree. This species is found in the Wet Tropics rainforest of north Queensland, between Townsville and Cooktown. In the summer wet season, males (about 23 mm long) climb a couple of metres into the vegetation and call with a loud bleating call. Populations of this species consist of five lineages, four of which meet in a complex hybrid zone that I have been studying.



Expenditure

Travel (international + domestic)	\$1,722
Accommodation	\$1,098
Fees (visa + fees)	<u>\$ 676</u>
Total	\$3,496

ERC Round 1	Applicant(s)	Nick Murphy
	Project Category:	Research Visit
	Project title:	Research Visit to Prof Jim Whitfield's Lab at the University of Illinois
	Funding awarded:	\$3,500

Background

The objective of my visit was to synthesize my work on microgastroid wasp phylogeny with polydnavirus (PDV) studies being undertaken by Prof Jim Whitfield and to learn new analytical techniques for the analysis of molecular phylogenetic data.

Project Description

The main purpose of this visit was to further enhance collaboration with Prof Whitfield and improve our current study of microgastroid phylogeny and PDV evolution. Activities included:

- An exhaustive search of fossil literature for the dating of microgastroid nodes. This will vastly increase the nodes for which dates are available.
- A discussion of the relative merits of a number of analytical methods and computer programs for undertaking molecular clock analysis. The result of which was to undertake the dating of the microgastroid nodes using penalized likelihood in the computer program r8s, which allowed the use of multiple fossil to calibrate minimum ages for a number of nodes.
- Cutting edge phylogenetic data exploration using the program Splitstree 4. In particular, Prof Whitfield demonstrated the use of 'filtered supernetworks' to examine the phylogenetic signal produced by individual genes, an analytical procedure that Prof Whitfield has helped to develop along with the Splitstree author, Daniel Huson.
- Progressed significantly a manuscript entitled 'Phylogeny of the microgastroid complex of subfamilies of braconid parasitoid wasps (Hymenoptera) based on sequence data from seven genes, with an improved estimate of the time of origin of the lineage', which will be submitted for publication before the end of the year
- Numerous roundtable and informal discussions with Profs Whitfield and Cameron, and their students, on the current state of hymenopteran molecular systematics and analytical methods.
- Future opportunities with regards to microgastroid systematics and phylogenetic analysis were explored.

Outcomes

This visit enabled Nick to improve his understanding of analytical techniques associated with molecular clock analysis and data exploration. He will be able to pass these newly acquired skills directly on to students who he is teaching.

The research visit has also strengthened the relationship between The University of Adelaide and The University of Illinois and there is a potential for further research collaboration.

Expenditure

Figures not available at time of this annual report publication

ERC Round 1	Applicant(s)	Daniel Warner, University of Sydney
	Project Category:	Laboratory visit
	Project title:	The Adaptive Significance of Temperature-Dependent Sex Determination in an Australian lizard
	Funding awarded:	\$ 1,000

Background

Daniel visited Professor Mats Olsson's laboratory at the University of Wollongong to study the adaptive significance of temperature-dependent sex determination (TSD) in a lizard from southeast Australia - the jacky dragon (*Amphibolurus muricatus*). In many reptile species, an individual's sex is determined by temperatures experienced by the embryo during development. The adaptive value of this mechanism has puzzled biologists for decades. A widely accepted hypothesis (the differential fitness model) for the adaptive significance of TSD states that incubation temperature affects the fitness of male offspring differently from female offspring. That is, temperatures that produce females are optimal for daughters and temperatures that produce males are optimal for sons. No rigorous experimental tests of this hypothesis have been conducted on reptiles. The objective of his research is to test this hypothesis.

Project Description

The funds provided allowed Daniel to travel to the University of Wollongong to learn and conduct specialized genetic techniques to determine parentage of the second generation of offspring. From February to April 2006 he spent time learning and optimizing the techniques. During this time he initiated DNA extractions from his samples and prepared a manuscript that describes the microsatellite markers that were developed specifically for jacky dragons. He also spent time testing the jacky dragon DNA markers on other lizard species that are being studied in Mats Olsson's laboratory. Fortunately, these tests indicated that several of the markers developed for the jacky dragon also work successfully in several other lizard species. Thus, Daniel's work will directly benefit future work coming from Mats Olsson's laboratory.

From May to August, he was able to finish all DNA extractions and successfully genotyped every individual lizard from his project and was very successful at assigning parents to the second generation of offspring. This allowed him to determine which individuals were successful at reproducing, thus enabling him to evaluate if temperatures during incubation have sex-specific effects on reproductive success.

Outcomes

The financial support enabled Daniel to acquire new skills (Optimization of primers for genetic studies, DNA isolation from tissue samples, PCR, Genotyping, parentage analysis) and has enhanced understanding of the evolution of TSD. The results suggest that TSD may be maintained because optimal incubation temperatures differ for sons versus daughters in a way that fits with predictions from the differential fitness model. These results provide the first empirical support for the differential fitness model and thus will make a substantial contribution to the field of sex determination.

This work also has implications for conservation of species with TSD. For example, TSD places several reptiles under serious threat from global climate change because even a modest change in environmental temperatures can massively shift offspring sex ratios. Results from this study demonstrate how such temperature changes may affect the fitness of the offspring.

Expenditure

Travel (domestic flights)	\$ 668.50
Venue Hire	\$ <u>592.80</u>
Total	\$1,261.30

ERC Round 2	Applicant(s)	Michael Schmidt
	Project Category:	Workshop
	Project title:	European Space Agency Summer School
	Funding awarded:	\$ 3,365

Background

Michael attended the 3rd European Space Agency summer school in Frascati, Italy, from 30 July to 12 August 2006. The summer school attracted 260 PhD students and post docs of which 65 were selected to attend from more than 15 countries and diverse backgrounds in earth sciences. The main motivation behind this school was monitoring and modelling of the earth system (<http://envisat.esa.int/envschool/>). A strong focus was placed on the technical aspect of data assimilation techniques in order to integrate data from various earth observations and their error descriptions (Kalman Filter, 4DVar).

Project Description

Lectures in the morning by world-known speakers were followed by practical exercises at computers in the afternoon. This gave the participants 'hands on' experience about topics of the morning sessions. The afternoon practicals were followed by poster sessions for one hour, where each participant got the chance to present his/her current work.

The lectures addressed the topics: Surface Energy, Data Assimilation, Sea Ice, Climate Change and Remote Sensing, Climate Modelling, Earth Explorers, Oceanography and Modelling. For a full program (including pdf versions of the lectures) visit:

<http://envisat.esa.int/envschool/programme.html>.

The first practical session introduced the educational software Bilko for image processing (<http://www.noc.soton.ac.uk/bilko/>).

Other exercises over the two weeks included the retrieval of sea surface temperature from AATSR data, the Benguela upwelling system using AATSR and MERIS data, Ocean Eddies using AATSR data.

Outcomes

Michael found the summer school very inspirational due the diverse background of attendees and the quality of the lectures. He learnt a lot during the two weeks and has developed a much better understanding of data assimilation methods. The extra knowledge will benefit his further work in science and the investigation of climate change impacts on Australian ecosystems.

It was also inspirational to meet so many talented young researchers from all over the world who are useful contacts for future international collaboration.



Photo of the summer school participants (source: <http://envisat.esa.int/envschool/>)

Expenditure

Travel (International, taxi and bus)	\$2,659
Accommodation	\$ 772
Total	\$3,431

ERC Round 2	Applicant(s)	Ben Phillips
	Project Category:	Laboratory visit
	Project title:	The evolution of dispersal in range-shifting populations
	Funding awarded:	\$ 3,500

Background

The three aims of this project were to:

- learn the mechanics of individual-based modelling,
- collaborate with Dr Justin Travis to explore the effect of range-edges on the spatial distribution of dispersal traits, and
- develop a foundation for further collaboration with Dr Travis.

Project Description

In the two weeks Ben spent at Aberdeen with Dr Travis he learnt the basics of constructing spatially-explicit, individual-based population models in the C++ programming language. They collaboratively developed a modelling framework in which to explore the effects of density dependence and range expansion on several dispersal-relevant traits. By the end of the period in Aberdeen they had written the program to run the models and had begun the task of exploring the parameter spaces. The work is ongoing, but initial results are very encouraging and Ben envisages that between two and three publications will result from this initial visit.

The timing of the visit coincided with a 4-day workshop organised by UKPOPNET at York University, which brought together Europe's leading experts on population modelling and climate change. Ben accompanied Dr Travis to this workshop where he met leading researchers in the field (Chris Thomas, Tim Benton, Calvin Dytham and Bob O'Hara). Much of this workshop was devoted to techniques for marrying individual-based models with field-collected data in a Bayesian framework, and several theoreticians expressed an interest in using data from the toad system to test and parameterise their models. He thus anticipates, not only further collaboration with Dr Travis at Aberdeen University, but also future collaborations with researchers at York University

Outcomes

Overall, this was an immensely productive trip. He expects to use what he has learned in Aberdeen to model entirely novel systems in the future. Additionally, the work begun with Dr Travis promises to yield useful insights into the evolutionary processes operating on range-edges, which will be critical for the predictions of the impact of climate change.

Expenditure

Travel (flights and train)	\$2,891
Accommodation	<u>\$ 788</u>
Total	\$3,679

ERC Round 2	Applicant(s)	Aaron Camens, PhD Candidate, University of Adelaide
	Project Category:	Laboratory visit
	Project title:	Research visit to Vera Weisbecker Lab, University of NSW
	Funding awarded:	\$731

Background

Aims of this project:

- To gain skills in clearing and staining the pouch young of certain marsupials in order to study osteological development.
- To collaborate with another researcher in investigating marsupial ontogeny and draw on their expertise to better understand my field of research.

Project Description

In late August 2006 Aaron visited Vera Weisbecker at the School of Biological, Earth and Environmental Sciences at UNSW in Sydney. While there he learned methods of clearing and staining animal specimens for osteological analysis as well as the use of several computer programs used for morphometric analysis including PAST (Palaeontological Statistics) and Mesquite. Potential for future collaboration on works relating to our PhD projects was also established.

While visiting the Palaeontology department there he also visited Dean of Science Professor Mike Archer to discuss my project and PhD students Robin Beck, Julien Louys and Anna Gillespie to discuss project and potential for future collaboration.

Outcomes

This visit provided him with an excellent opportunity to visit one of the largest palaeontological study groups in Australia. I learnt about what other projects are currently being undertaken as well as several procedures and programs that will be useful in my PhD research. It also provided him with the opportunity to establish links and potential future collaborative efforts with other Australian researchers.

Expenditure

Travel (domestic)	\$329
Accommodation	<u>\$250</u>
Total	\$579

ERC Round 2	Applicant(s)	Dr Rajkumar Radder, ARC Postdoctoral Fellow, University of Sydney, School of Biological Sciences
	Project Category:	Laboratory visit
	Project title:	Attending a laboratory-training course to learn molecular sexing methods for lizards and snakes
	Funding awarded:	\$ 1,800

Background

The aim of this project was to understand the evolution of diverse sex determination mechanisms in vertebrates using Australian novel reptilian systems by adopting traditional 'hemipenes everson' and histology method to sex newborn babies. These methods are efficient and 100 % reliable, but have some flaws as well as drawbacks. For instance, the histology method is time consuming and unfortunately requires animal sacrifice, and thus does not allow us to understand the long-term adaptive fitness of the babies. Hemipenes everson provides phenotypic sex information but is not designed to understand genetic architecture of the babies. Recent discovery of molecular sexing methods can overcome some of the problems associated with the above traditional sexing methods. Also, molecular sexing methods allow us to understand genetic mis-matching of sex if any. Hence, Rajumar wanted to attend a laboratory training course in molecular sexing methods and apply it to ongoing work on *Bassiana duperreyi* in the first instance and to other Australian reptiles in the future.

Project Description

Rajumar selected Arthur Georges lab at the University of Canberra, ACT, because Arthur and his collaborators are involved in developing molecular markers for sexing lizards and have an international reputation in this area.

He took 100 tissue samples of offspring of lizard *Bassiana duperreyi* from various incubation regimes and sex reversed phenotypes by the application of steroid hormones to eggs to University of Canberra and spent more than two weeks learning the methods of molecular sexing there.

Outcomes

He learned cutting-edge molecular sexing techniques that overcome several disadvantages of the traditional sexing methods like gonadal histology. He intends to adopt this technique for sexing large numbers of reptilian offspring. Also, during his stay in Canberra, he gave two talks on his research findings i.e. one in University of Canberra and another in Australian National University.

The financial support provided by the environmental futures network will aid in enhancing our understanding of the evolution of sex determining mechanisms. This work also has implications for conservation of species with multi-modal sex determination. For example, TSD places several reptiles under serious threat from global climate change due to global warming because even a modest change in environmental temperatures can massively shift offspring sex ratios.

Expenditure

Figures not available at time of this annual report publication

WGP Round 1	CI(s):	Prof Terry Hughes, James Cook University, Coral Reef Centre of Excellence
	Project title:	Coping with change: resilience of marine social-ecological systems
	Total Funding over 3 cycles:	\$90,000 (cycle 1 \$30,000)

Background

Until recently marine biologists, social scientists, managers and people who fish lived in parallel but decidedly separate universes. They understood their world but didn't understand what other groups were saying about their world.

A group of people from natural and social sciences have formed the Marine Resilience Alliance in order to see if solutions to problems in marine conservation and management can be found in the nexus of these disciplines. The group, who gathered in Maine, are among the first to consider social-ecological resilience in marine ecosystems. The group that has met in far-flung locations such as Australia and Sweden and saw a potential problem and opportunity to focus their attention on the Gulf of Maine's coastal zone.

The term ecosystem "*resilience*" was coined in 1973 to identify the behaviour of natural ecosystems and factors that contribute to their stability. It was quickly observed that many land and marine ecosystems "flip" into alternate (often undesirable) states. The science of resilience seeks to understand what contributes to the ability of ecosystems to resist change or, if changed, to recover to its previous more desirable state.

Escaping the Gilded Trap

Our failure to manage most marine fisheries illustrates the difficulties in managing common property that too often results in the tragedy of the commons. Overfishing results from the collective impact of reasonable fishers seeking to sustain their livelihood. Diverse resources allow fishers to target whatever is most valuable often sequentially depleting species.

The Gulf of Maine provides an excellent example of long term sequential depletion of fisheries species such as cod, hake, haddock, halibut and sea urchins that has contributed to the booms and busts of species. The loss of functional diversity has resulted in a near monoculture of lobsters that had formerly been prey of predators. In Maine, the American lobster has reached hyper-abundance over large stretch of the coast and today it comprises over 80 % of the total marine resource value. However, this economic success does not equal ecosystem success. The hyperabundance of lobsters has now over 7,000 lobstermen and their support industries depending upon this single species.

Elsewhere in New England, high densities preceded a devastating shell disease the late 1990s. Clearly lobster-dominated ecosystems are not immune to collapse.

A collapse of the Maine lobster fishery would be a socio-economic disaster to coastal communities throughout the region. Such a collapse would likely result in rapid gentrification loss of coastal access and exclusion of the fishing community and its associated infrastructure. Thus a rapid collapse of this one species could trigger a rapid social transformation to an unfavourable social state.

Escaping the trap: Creating options.

Traps in the marine system are particularly hard to navigate. The parallel to the terrestrial realm is attractive but largely unattainable because marine systems are more open, and less predictable.

The Maine lobster fishery has a well developed conservation ethic. The lobster fishing communities have a history of acting to the benefit of long-term sustainability. A list of effective management measures such the prohibition of harvesting lobsters larger than 5' on the carapace was initiated by the lobster fishers once they recognized the problems caused by their fishing.

Project Description

Marine Resilience Alliance met at the Darling Marine Centre Maine 24-31 August 2006. The workshop theme "Socioecological traps and transformations in marine fisheries" was chosen to explore the following issues. Could a larger sense of community be applied to the depleted coastal ecosystems of the Gulf of Maine? If so, what form of governance could work with that extended community? Is it possible that ecosystem-based co-management could result that fosters the political will to allow groundfish stocks to recover and to reinvent fishing so the mistakes of the past are not repeated. The first step of many must be to explain to stakeholders and policy makers what's at risk if we cannot escape this gilded trap.

Outcomes

- Bellwood, D.R., Hughes, T.P., & Hoy, A.S. (2007) Sleeping Functional Group Drives Coral-Reef Recovery, *Current Biology* 16,2434-2439
- Berkes, F., Hughes, T.P., Steneck, R.S., Wilson, J.A., Bellwood, D.R., Crona, B., Folke, C., Gunderson, L. H., Leslie, H.M., Norberg, J., Nyström, M., Olsson, P., Österblom, H., Scheffer, M., Worm, B., Globalization, (2006) Roving Bandits, and Marine Resources. *Science* 311,1557-1558
- Dornelas, M., Connolly, Sean, S.R., Hughes, T.P., (2006) Coral reef diversity refutes the neutral theory of biodiversity, *Nature* 440, 80-82
- Hughes, T.P., Rodrigues, M.J., Bellwood, D.R., Ceccarelli, D. Hoegh-Guldberg, O., McCook, L., Moltschaniwskyj, N., Pratchett, M.S., Steneck, R.S., & Willis, B. (2007) Phase Shifts, Herbivory, and the Resilience of Coral Reefs to Climate Change, *Current Biology* 17, 1-6
- Hughes, T.P., Bellwood, D.R., Folke, C.S., McCook, L.J. & Pandolfi, J.M., No-take areas, herbivory and coral reef resilience, *TRENDS in Ecology and Evolution* 22:1, 1-3

Expenditure

Travel (overseas and domestic flights)	\$12,648
Operating fees	\$ 74
Hire of venue, conference facilities	<u>\$13,007</u>
Total	\$25,729

WGP Round 1	CI(s):	Dr Peter Gell, University of Adelaide; Dr Scott Mooney, University of New South Wales; Dr Henk Heijnis, Australian Nuclear Science & Technology Organisation; Dr Tim Denham, Monash University
	Project title:	Recent Human Impact on Australian Ecosystems (OZPACS)
	Total Funding over 3 cycles:	\$79,000 (cycle 1 \$23,500)

Background

The OZPACS project has the following aims:

- To assemble the known fine-resolution palaeoecological data and to establish an accessible data base.
- To apply the data-base to document ecosystem change over centuries to aid managers identify targets for restoration and assess heritage significance.
- To assess the range of technologies available to reconstruct fire regimes and to generate a spatial data-base of fire regime change over the last 500 years.
- To share experiences of techniques used in short term studies and to assemble an exotic pollen data-base to calibrate the arrival of types (e.g. Pinus).
- To map the location of short-term studies and establish a priority system to assist future researchers to contribute a comprehensive assessment of recent human impact across a wide range of Australian ecosystems.

The OZPACS network met in Canberra 17-19 April 2006. The meeting was lead by Dr Tim Denham, Dr Scott Mooney and Dr Sophie Bickford and there were 16 participants.

Project Description

April Workshop

All presenters in Canberra were asked to place their PowerPoint presentation on the OZPACS portion of the EFN website at <http://nesuab.ees.adelaide.edu.au/>. All talks will be put on the password protected portion of the website thereby allowing access to OZPACS participants only.

A short review of OZPACS and the Canberra workshop will be written for Quaternary Australasia to raise the profile of the working group. Scott Mooney and Tim Denham are organising a session for the Australian Archaeological Association conference (AAA) at Beechworth in December 2006; see <http://www.latrobe.edu.au/aaa2006/sessiondescriptions.html>, with scope overlapping that of OZPACS –i.e it focuses on the integration of archaeological and palaeoecological data and is entitled 'Human-environment interactions in Australia: temporality and mutual transformations'. The proceedings will be published as a Special Issue of *The Holocene* at the end of 2007.

OZPACS will establish a database for sites and research undertaken across a range of fields that are relevant to understanding environmental change in Australia over the last 500 years. It was agreed that it would include the following subject areas: charcoal, archaeology, pollen, phytoliths, lead dating, other dating markers, OSL, charophytes, diatoms, macrofauna, macrobotany. Those responsible for each database area will establish the types of information to be included in consultation with Scott Mooney or Tim Denham. The target for databases completion for specific regions was set at 30 September 2006. An example of the type of database we have in mind has been constructed for the worldwide charcoal database see <http://www.bridge.bris.ac.uk/charcoal>

A GIS will be set-up to accompany the multi-disciplinary database. The GIS co-ordinator will be Sophie Bickford. The GIS/database will be up and running (even if incomplete) by the next OZPACS meeting.

Much discussion at the meeting in Canberra focussed around the identification of sites that offer the best potential for multi-proxy environmental reconstructions for the last 500+ years. The intention is to generate 'sub-decadal resolution' (although noted to be a problematic term) for that period. The sites would serve as 'best practice' records for the region in accordance with the aims of Focus 5 (IBG- PAGES). At the meeting several sites were suggested as potential candidates, although these are only intended as indicative suggestions and would require consideration of on-going and planned research projects and funding.

Site selection criteria are:

- the site must have relevance to a major issue in natural resource management (eg salinity, acid sulphate soils, post-industrial pollution, fire, revegetation);
- the site must have a fast rate of sedimentation and be undisturbed (allowing fine temporal resolution analyses);

- the site must be amenable to dating (eg for ^{210}Pb certain catchment/lake area ratios are more advantageous);
- the site should have a known history (or available history) of human impacts;
- some preliminary work on the site demonstrating sedimentation rates etc would be useful.

Potential sites identified at the workshop include Bega, Lake Surprise, Bromfield Swamp/Quincan Lake and Blue Lake (NSW). These sites offer the best potential for obtaining high resolution multi-proxy records that enable an insight into the processes of environmental change, ie, amenable to ecological timescales, allow inferences about process, and show rates of biodiversity loss. Additionally, they enable the development of methods and 'proof of concept', ie, draw different lines of evidence together, provide a highly defensible record, indicate best practice, and overcome a possible credibility gap. The type of outcome anticipated is similar to that published by Haberle et al. forthcoming paper in *Journal of Ecology* 2006.

Stephen Gale, Gary Hancock, Quan Hua and others will write a block of papers, based on those presented at OZPACS in Canberra, on protocols for dating recent (last 500 years) environmental change. It is hoped they will appear in the *Quaternary GeoChronology* under 'Dating the recent past'.

Future Meetings

Several ideas for the next meeting were discussed.

Simon Haberle suggested that a major portion of the next meeting be given over to paired presentations, whereby a 'research team' and 'resource manager team' present separate papers on ongoing work for a particular site, drainage basin or region. The idea being to see how research feeds into management and to assess how managers (one end user) view research.

Following discussions with archaeologists and others after the Canberra meeting, Tim Denham proposed that it is important that the cultural component to recent environmental change is addressed more squarely. In particular, he proposed a session allocated to environmental history – whether undertaken by 'environmental historians' or teams comprising archaeologists/historians with palaeoecologists.

International Context

Peter Gell was in the U.K. for 2006 (as per the proposal) and met with Rick Battarbee (Director of Focus V LIMPACS) and John Dearing (Director of Focus V and HITE) on several occasions. These included discussions as to the proposed future structure of PAGES Focus V. A new plan was ratified at the PAGES meeting in Argentina and 'Focus IV,' as it is now, is entitled Past Human-Climate-Ecosystem Interactions (PHAROS). It retains HITE (Human Impacts in Terrestrial Systems), LUCIFS (Land Use and Climate Impacts in Fluvial Systems) and LIMPACS but has Intemods as activity 1 that will focus on a) climate hotspots (*sensu* Giorgi, 2006, *Geophysical Research Letters*), b) water resource science c) soil resource science and d) land cover (ecosystem) science. Battarbee is to be the leader of the water: globval syntheses intermod but he approached Gell to take on that role (with John Anderson) over the coming years.

Gell presented research at the LUCIFS workshop in Frankfurt in May and chaired a session bringing together recent advances in fluvial research with a view to publishing in a special issue of geomorphology. He presented at the Focus V session of the International Paleolimnology Conference symposium on river systems. He also undertook field research on Lake Taihu on the lower Yangtze River in collaboration with UCL and Nanjing University and discussed arrangements for the forthcoming LIMPACS meeting with Battarbee and Prof. Shijie. He was one of six speakers to the special Focus IV session at the Earth Systems Science Partnership Conference in Beijing. Here he discussed plans for a special Focus IV session as part of the forthcoming INQUA meeting in Cairns and a separate workshop to launch PHAROS and explore the new structure.

Future Meetings

February 2007, ANSTO, Sydney. Jennifer Harrison to host.

August 2007: Cairns. Pharos launch, special session in INQUA and OZPACS business meeting.

November, 2007: Adelaide. Peter Gell to host.

Outcomes

Gell, P., Mooney, S., Bickford, S. & Denham, T. (2006). Ozpacs: Recents impacts on Australian ecosystems. *Quaternary Australasia* 24(1): 10-11. (not a refereed journal article but a notice to inform the Australian Quaternary community of the existence of OZPACS.

The meeting held early 2007 with eighteen participants at Lucas Heights was very productive.

There are plans for grant applications for the ARC November round and it is intended that national databases be assembled by late April 2007.

Expenditure

Travel (April meeting)	\$4,385
Underspent funding owing to the deferment of the proposed November meeting to February 2007.	
Request to carry forward remaining balance.	
	<hr/>
Total	\$4,385

WGP Round 1	CI (s):	Dr Tim Denham, Monash University, School of Geography & Environmental Science
	Project title:	Plant exploitation and domestication east of the Wallace Line: movement, manipulation and management of plant biodiversity
	Total Funding over 3 cycles:	\$87,450 (cycle 1 \$29,050)

Background

The first meeting in the workshop series was conducted at the Canberra Museum and Art Gallery on 24 and 25 August 2006. The workshop forms part of an original 3-year proposal to foster cross-disciplinary exchange and to develop long-term research agendas regarding the effects of traditional plant exploitation practices on plant morphogenetics and biodiversity in Australia and New Guinea.

In line with the original proposal, the first workshop focused on understanding plant exploitation practices across New Guinea and Australia. The workshop was highly successful; most significant researchers in the field were present, knowledge 'gaps' were identified and new research frameworks and synergies were outlined.

Project Description

In terms of measuring workgroup success and potential, each point of the original application criteria is addressed in turn

The workgroup addressed key issues associated with the development of Australia's (and New Guinea's) biodiversity and its management; namely, how people have harnessed plant resources for food over the last 50 000 (or so) years. As well as focusing on specific plants and issues of ecotypic, phenotypic and genotypic variation/selection, the workgroup focuses on the effects of land management practices through time on resource intensification and plant distributions. Since human colonization, most landscapes across Australia bear evidence of varying degrees of management for animal and plant exploitation. This workgroup addresses these issues because they serve as a context, and a causal factor, for understanding how specific (and the most important) food plants have changed through time (in terms of phenotypic/genotypic change, resource density, distribution, and so on) under human management.

The workgroup consists of several smaller working groups that are focusing on specific issues that are common to Australia and New Guinea: land management/resource intensification/plant distributions; ecotypic/phenotypic/domesticatory variation; roots/tubers/macrophytes/etc; arboriculture/tree foods; and, components of food system. These smaller working groups are addressing common concerns from a novel conceptual perspective, because they are seeking to overcome traditional dichotomous portrayals of plant exploitation in Australia and New Guinea (see attached draft working paper – not for circulation and in confidence).

The first workshop brought together people from a disparate array of disciplines (including agronomy, anthropology, archaeobotany and archaeology, botany, ecology, ethnobotany, geography, palaeoecology and palaeobotany) with the intention of identifying new research synergies (ongoing), as well as locales and research structures for 'best practice'. A major problem in understanding plant exploitation through time and its consequences for biodiversity are the piecemeal fashion in which studies are undertaken. A major outcome of the workshop was to identify regions where future cross-disciplinary research and syntheses should be targeted. At present, workers in different fields work in isolation; the broader contexts advocated during the workshop provide the necessary integrated studies to effectively address new synergetic themes (see attached draft working paper – not for circulation and in confidence). Each region can serve as the basis for grant applications from cross-disciplinary research teams.

The leader of the working group (Dr Tim Denham) is an ECR (PhD awarded in 2004). Additionally, five other participants in the first workshop are ECRs (including three PhD students); a sixth was absent due to illness.

The summary document is being refined for submission to a major international, peer-reviewed journal – *Evolutionary Anthropology*. After each workshop next year, a summary based around the theme of the workshop will be produced for a major international journal. At the end of the project, key participants will write a statement for publication in a major journal (*Nature/Science*) and publish contributions in a Special Issue of an international journal (*Economic Botany*). Furthermore, the cross-disciplinary research projects initiated as a result of this workshop series have the potential to yield multiple publications for major international journals (such as *Nature/Science/PNAS*).

The cross-disciplinary research to be planned once the workshop series is completed has the potential to yield research applications that will be internationally competitive and will yield research of the highest calibre. The frameworks that will be developed to investigate plant exploitation (including genetics – both modern and ancient) has the potential to revolutionize the way we conceive of domestication, will shed light on the morphogenetic effects of long-term management of starch-rich plants in Australia and New Guinea, and will inform debates concerning the role of humans in the creation and management of Australia and New Guinea's biodiversity.

Resource management agencies have only a limited role within this workgroup, however, representatives of Indigenous groups from Australia and New Guinea will participate in the last workshop planned for late 2007.

Outcomes

Based on a highly successful first workshop, as well as ongoing plans for a second workshop in early 2007, the total budgeted amount (\$29,650) for Year 2 has been requested. In line with the original application, the second workshop will focus on understanding how plants have changed through time with regard to: a) their general evolutionary trajectories; b) their biological characteristics, c) the effects of environmental change, and d) the effects of different plant exploitation practices upon them.

Expenditure

Travel	\$ 5,476
Accommodation	\$ 2,763
Venue Hire	\$ 910
Meals	\$ 1,106
Operating	\$ 4,500
Sundries	<u>\$ 191</u>
Total	\$14,946 (balance \$14,104 request carry forward)

WGP Round 1	CI(s):	Prof Peter Kershaw, Monash University
	Project title:	Land-ocean correlation of long Quaternary records from the southern hemisphere on orbital and sub-orbital timescales
	Total Funding over 3 cycles:	\$41,000 (cycle 1 \$28,000)

Background

It was considered that an independent project on the environmental history of the Australia and its relationships to other southern hemisphere continents would provide a firm and comprehensive historical basis for examination of the more recent evolution of the pattern and biodiversity of the landscape that could be applied by other related groups within the network and to the future informed management of this diversity.

Project Description

A workshop was organised for 22-23 February 2006 at the Royal Society building in Melbourne to coincide with an ARC-supported climate modelling workshop 'Earth System Models of Intermediate Complexity'. The modelling workshop was relevant to the Environmental Futures Network project and designed to facilitate interaction between data and modelling communities. Unfortunately, the data workshop had to be cancelled because too many of the invited participants withdrew due to alternative commitments. However, there was substantial involvement of data people in the modelling workshop both in terms of invited presentations and discussion.

It is now planned to hold the workshop in mid-May, a time that seems more suitable for network members. This will also allow time for the database, that already contains a significant amount of information, to be launched on the internet. The preliminary database was established with support from an International Quaternary Association grant and as yet no network funds have yet been committed.

Outcomes

Web site and data base development

The web site is up and running. It can be seen at <http://users.monash.edu.au/~pkershaw/> It is linked to other relevant sites. A great deal of information including a near complete reference list and location for almost all terrestrial and marine/terrestrial records covering at least the last 40,000 years is contained for the Australian-Southeast Asian region. Effort has also been put into understanding the structure requirements and protocol of the PANGEA archive system as a potential repository of actual data and ensure its maximum survival, availability and usage. At the same time, access to metadata and data for the data base has been achieved from researchers at Bremen, to broaden coverage geographically.

Publications

The project has, along with the upcoming INQUA Congress in Cairns (July 2007), been a driving force behind publication. A list of papers from the group has not yet been assembled but the following publications involving Monash researchers, as well as a number of other group members, provide an indication of activity. They cover full description of long records providing information on patterns of vegetation change and plant extinction in relation to climate and human forcing; the development of pollen databases and their application, through transfer function analysis, to quantification of past climates, both annual and seasonal; regional syntheses at a variety of scales and with different climate and biomass burning proxies; and modelling of the late Quaternary.

Cook, E.J., van der Kaars, S. (2006) Development and testing of transfer functions for generating quantitative climatic estimates from Australian pollen data. *Journal of Quaternary Science* 21: 723-733.

Kershaw, A.P., Bretherton, S.C., van der Kaars, S. (accepted) A complete pollen record of the last 230 ka from Lynch's Crater, northeastern Australia. *Palaeogeography, Palaeoclimatology, Palaeoecology*.

Kershaw, A.P., McKenzie, G.M., Porch, N., Roberts, R.G., Brown, J., Heijnis, H., Orr, M.L., Jacobsen, G., Newall, P.R. (under revision a) A high resolution record of vegetation and climate through the last glacial cycle from Caledonia Fen, south-eastern highlands of Australia. *Journal of Quaternary Science*.

Lynch, A.H., J. Beringer, P. Kershaw, A. Marshall, S. Mooney, N. Tapper, C. Turney, and S. Van Der Kaars, 2007: Using the paleorecord to evaluate climate and fire interactions in Australia. *Annual*

- Review of Earth and Planetary Sciences, 35, 215-239, doi:10.1146/annurev.earth.35.092006.145055
- Marshall, A.G., and A.H. Lynch (2006) Time slice analysis of the Australian summer monsoon during the late Quaternary using the Fast Ocean Atmosphere Model, *Journal of Quaternary Research*, 21, 789-801
- Moss, P.T., Kershaw, A.P. (under revision b). A late Quaternary marine palynological record (Oxygen isotope stages 1-7) for the Humid Tropics of northeastern Australia based on ODP Site 820). *Palaeogeography, Palaeoclimatology, Palaeoecology*.
- Kershaw, A.P. van der Kaars, S. (2007) Late Pleistocene pollen records: Australia and New Zealand. In Elias, S. (Ed.), *Encyclopedia of the Quaternary*. Elsevier, Amsterdam, pp. 2613-2622.
- Sniderman, J.M.K., Pillans, B., O'Sullivan, P.B., Kershaw, A.P. (in press) Climate and vegetation in southeastern Australia respond to Southern Hemisphere insolation forcing in the late Pliocene – early Pleistocene. *Geology* (published on-line),
- Turney, C.S.M., Haberle, S., Fink, D., Kershaw, A.P., Barbetti, M., Barrows, T.T., Black, M., Cohen, T.J., Correge, T., Hesse, P.P., Qua, Q., Johnston, R., Morgan, V., Moss, P., Nanson, G., Van Ommen, T., Rule, S., Williams, N.J., Zhao, J-X., D'Costa, D., Feng, Y-X., Gagan, M., Mooney, S., Xia, Q. (2006). Integration of ice-core, marine and terrestrial records for the Australian Last Glacial Maximum and Termination: a contribution from the OZ INTIMATE group. *Journal of Quaternary Science* 21: 751-761.
- Turney, C.S.M., Kershaw, A.P., Lynch, A. (2006) Integrating high resolution past climate records for future prediction in the Australasian region. Special issue *Journal of Quaternary Science* 21(7) 679-801.
- van der Kaars, S., De Deckker, P., Gingele, F.X. (2006) A 100,000-year record of annual and seasonal rainfall and temperature for northwestern Australia based on a pollen record obtained offshore. *Journal of Quaternary Science* 21: 879-889.

Future Plans

Specific research directions will become clearer after the Southern Connection meeting where it is hoped that multi-authored INQUA presentations and subsequent publications based on specific research areas, such as the Mid Pleistocene transition, the mid-Brunhes event, the last glacial cycle and non-stationarity in monsoon and ENSO activity, can be identified. We are confident that there will be a good response generally to the proposed INQUA symposium.

In relation to the website, and database, it is hoped that a number of features, including the design of a user interface and entry of all metadata into Filemaker, the development of a kiosk to make the database available for download from the website, collection of raw data, archiving references into eLibrary in Endnote, geographical expansion of site entries etc. will be being investigated or continued.

Although presently limited to the Quaternary, it was anticipated in the original application that the project would provide a framework that could be extended to accommodate earlier periods. Such an extension would help to better explain some features of the late Quaternary including the longer term evolution of the vegetation and flora. Until now, it has been difficult to conceptualise a program that might overcome the severe limitation of lack of long cores offshore and fossil bearing sediments onshore that might provide the required material. It now appears that recent marine sediment drilling along with the identification of near shore sediment outcrops can allow a general picture of the climate and vegetation history of the continent to be constructed through the Pliocene and early Quaternary, and address the roles of tectonics and changing ocean circulation patterns in forcing change. It is intended to submit an ARC application led by Stephen Gallagher (University of Melbourne) and including expertise in palaeoceanography and palynology as well as marine geology that may produce required results, hopefully from the beginning of 2008.

Expenditure

Only an indication of expenditure can be provided due to the concentration of the budget on supporting travel and accommodation costs associated with attendance at the Southern Connection Conference and associated workshop sessions organized for the last evening of the meet and the following day. These costs can only be finalized when receipts are received after payment has been made by most recipients.

WGP Round 1	CI(s):	Dr Dan Faith, Australian Museum Dr Simon Ferrier, Department for Environment and Conservation NSW
	Project title:	Multidisciplinary approaches to key Australia biodiversity challenges of 2010 and beyond
	Total Funding over 3 cycles:	\$88,000 (cycle 1 \$28,000)

Background

Australia's 2010 target is "a significant reduction of the current rate of biodiversity loss". Limitations of conventional indicators for 2010 now require "broadening the science" (Science 2010 essay). The Millennium Ecosystem Assessment argues:

"Biodiversity surrogates based upon best possible use of a combination of environmental and species... data may provide greater certainty in estimating biodiversity patterns. Such a 'calculus' of global and regional biodiversity may allow biodiversity targets to be formulated in ways that integrate socioeconomic factors" and "may provide one pathway for addressing ... the 2010 biodiversity target".

The research challenge is to 1) develop a biodiversity calculus integrating best-possible use of available biotic and environmental data, and 2) link this to socio-economic factors, to address the 2010 target, plus other climate and land-use change pressures.

Exploring novel, multidisciplinary, approaches to 2010-target assessment (e.g., <http://www.sciencemag.org/cgi/eletters/307/5707/212#1272>) requires building on current opportunities to bring together exciting developments in different disciplines, eg:

1. recent work by Australian Greenhouse Office (AGO), on carbon accounting, has synthesized continental-scale land-cover change since 1972.
2. a prototype calculus has been demonstrated in Bioscience; it raises prospects of links with climate and land-use change scenarios, plus integration with phylogenetic pattern.

Project Description

Our network project will address biodiversity scenarios relating to the 2010 target plus other land-use and climate change pressures at the scale of continental Australia. It brings together workers on #1 and #2 above, plus much related work. Information complementing biotic data of museums and related data bases includes: AGO's 12 snapshots since 1972 of detailed land-cover change for Australia, and national environmental audit information and ANU climate data providing environmental layers for surrogate-building. Addressing stated Aims is based on networking scientists across disciplines of biodiversity, climate change/ carbon accounting, remote sensing, land-use planning, systematics/biogeography, and environmental/economic audits.

Early workshops will focus on synthesis of existing data, analytical frameworks, and software. Later workshops will discuss pilot analyses and grant preparation. Project results will be presented at an international symposium focused on the project, at ICSEB 2008.

Working group members

See <http://www.ees.adelaide.edu.au/nesuab/main.html>

Progress and activities, late 2005, 2006

Activities in the 1st year addressed Australia's biodiversity and its management through its focus on the core goal to address biodiversity scenarios relating to the 2010 target plus other land-use and climate change pressures at the scale of continental Australia. The meetings and interactions have already led to some developments of new analytical approaches. The paragraphs below highlight some of the outputs, achievements, and collaborations.

Two planned meetings to progress the working group were completed in late 2005 - discussions and presentations were made at the First DIVERSITAS Open Science Conference: "Integrating biodiversity science for human well-being", 9-12 November, Oaxaca, Mexico, and at the Conference of the Australian Entomological Society/Invertebrate Biodiversity and Conservation /Australian Systematics Society, Canberra, Australia, 4-9 December.

Two planned meetings to progress the working group were completed in 2006. The large meeting, in June in Sydney allowed presentations on a wide range of topics linked to the objectives. Progress was made in plans for a continental scale GDM model for Australia with links to AGO data. DEH indicated funding input

for this effort.

The follow-up Armidale meeting (see below) worked through the details of a work plan for GDM models.

Meanwhile, the World Conservation Monitoring Centre (WCMC) has established a "Biodiversity Indicators Partnership, and their web site now links to 2010 working group, as an emerging case study: <http://www.twentyten.net/initiatives.htm>

Williams, Margules, Slatyer, Roseaur, Faith, Pert, and other members of the working group presented progress on the proposal for a new eastern Australian global hotspot that the group plus others has been preparing over the past two years, with DEC, DEH, and CSIRO. Progress on this proposal is now coordinated through the 2010 working group.

The proposal for a symposium, involving several working group members, on conservation and phylogenetic diversity, at the 2007 meetings of the Society for Systematic Biology was accepted, resulting also in a grant of \$5000. (Evolution 2007 will be held June 16th - 21st in Christchurch, New Zealand, at the Canterbury Convention Centre. see <http://www.evolution2007.com/>)

Other efforts in the first year focused on expanding communication. Five members of the working group joined a U.S-based "blog" on systematic conservation planning, in which the EFN working group's activities and strategy for 2010 were advertised.

Members of the working group (Yeates, Faith, Ferrier, Slatyer) formed the Australian coordinating committee for DIVERSITAS – "By linking biology, ecology and social sciences, DIVERSITAS produces socially relevant new knowledge to support sustainable use of biodiversity."

Members of the working group produced a first 2010 case study by building on existing funding and work through Conservation International: Daniel P. Faith, Kristen J. Williams, Susan E. Cameron, David K. Mitchell and Chris Margules Systematic Conservation Planning and the 2010 Biodiversity Target: integrating biodiversity and socio-economic factors in Papua New Guinea, to appear in *global Environmental Change: Social and Policy Dimensions*

Outcomes

Working group meetings abstracts and reports

Ferrier S. 2005. New directions in spatial modeling of terrestrial biodiversity for conservation assessment and land-use planning. In: Australian Entomological Society's 36th AGM and Scientific Conference/7th Invertebrate Biodiversity and Conservation Conference/Australian Systematics Society. Canberra, Australia, 4-9 December 2005. pp. xxxii-xxxiii.

Faith DP & Williams KJ. 2005. How Large-scale DNA Barcoding Programs Can Boost Biodiversity Conservation Planning: Linking Phylogenetic Diversity (PD) Analyses to the Barcode of Life Database (BoLD). In: Australian Entomological Society's 36th AGM and Scientific Conference/7th Invertebrate Biodiversity and Conservation Conference/Australian Systematics Society. Canberra, Australia, 4-9 December 2005. pp. 83-84.

[this paper proposes that DNA barcoding can greatly boost biodiversity surrogates information for use in conservation planning tools, both through species data and through phylogenetic pattern and PD]

[Download](#) (PDF 57k)

Faith, DP 2005. Phylogenetic diversity (PD) provides biodiversity surrogates information that can enhance the contribution of DNA barcoding programs to conservation planning. In: First DIVERSITAS Open Science Conference: "Integrating biodiversity science for human well-being", 9-12 November 2005, Oaxaca, Mexico. Symposium 14 - Phylogeny and biodiversity science. (symposium link: http://www.diversitas-osc1.org/docs/symposia/Symposium14_23Sept05.pdf) ([download abstract](#) PDF 56.7k)

Working group contributions:

Faith, D. P. and K. J. Williams (2006) Research needs and challenges for the "systematic conservation planning" approach to the 2010 biodiversity target. In: 'How to reach the 2010 – and beyond – target', e-conference hosted by the European Platform for Biodiversity. Available (as 'guest') at: <http://forums.ceh.ac.uk:8080/~bioplatform/read?8217,388>

Faith, D. P. (2006) RE: The need for interdisciplinary research. In: 'How to reach the 2010 – and beyond – target', e-conference hosted by the European Platform for Biodiversity. Available (as 'guest') at: <http://forums.ceh.ac.uk:8080/~bioplatform/read?8403,388>

Faith, D. P. (2006) 2010 indicators for overall biodiversity. In: 'How to reach the 2010 – and beyond – target', e-conference hosted by the European Platform for Biodiversity. Available (as 'guest') at:

<http://forums.ceh.ac.uk:8080/~bioplatform/read?8464,388>

Williams K. J., Faith, D. P. and S. Ferrier (2006) A practical framework for conservation scenarios and planning for the Southwest Australia Ecoregion, pg 12 in: *Conservation Planning symposium, Program and abstracts* Perth W.A. 27-28 Sept. 2006.

Williams, Kristen J, Daniel P Faith, Andrew Ford, Dan Metcalfe, Petina Pert, Dan Rosauer, Cameron Slatyer, Simon Ferrier, Hal Cogger, Chris Margules, Roger James, Steve Williams, (2006) Progress in defining the status and extent of a global high-biodiversity hotspot in Eastern Australia. Pg 11 in: *Conservation Planning symposium, Poster abstracts*. Perth W.A. 27-28 Sept. 2006. In work initiated by CSIRO through its partnership with Conservation International, a network of researchers across Queensland and New South Wales have been investigating potential boundaries for the hotspot. Preliminary boundaries followed the two WWF Ecoregions – “Queensland Tropical Rain Forests” and “Eastern Australian Temperate Forests” (http://www.panda.org/about_wwf/where_we_work/ecoregions/about/index.cfm). Within these boundaries, lists of plant endemics and extent of vegetation loss are being investigated. This work is being coordinated through the 2010 working group.

Other working group publications:

Faith DP & Williams KJ. 2006. Phylogenetic diversity and biodiversity conservation. *McGraw-Hill Yearbook of Science and Technology* Pp. 233-235.

http://www.accessscience.com/ResUpdates/2006/YB_061020_frameset.html

Faith DP & Baker AM. 2006. Phylogenetic diversity (PD) and biodiversity conservation: some bioinformatics challenges *Evol. Bioinformatics Online* 2: 70–77. available at: [http://www.la-press.com/EBO-2-Faith\(Pr\).pdf](http://www.la-press.com/EBO-2-Faith(Pr).pdf)

Faith DP. 2006. The role of the phylogenetic diversity measure, PD, in bio-informatics: getting the definition right *Evol Bioinformatics Online* 2:301-307. available at: [http://www.la-press.com/EBO-2-Faith-Perspective\(Pr\).pdf](http://www.la-press.com/EBO-2-Faith-Perspective(Pr).pdf)

Invited follow-up on the debates arising at DIVERSITAS, by 2010 working group members, will appear as guest editorial in *Journal of Biogeography*. Faith DP & Baker AM in review. Biodiversity, barcoding and biogeography. *J Biogeography*

Expenditure

Travel (International & Domestic)	\$ 4,471
Accommodation	\$ 8,400
Venue Hire (covered by Museum)	\$ -
Catering	\$ 2,264
Incidentals	<u>\$ 450</u>
Total	\$15,585

The remaining balance will be spent for associated software and data acquisition.

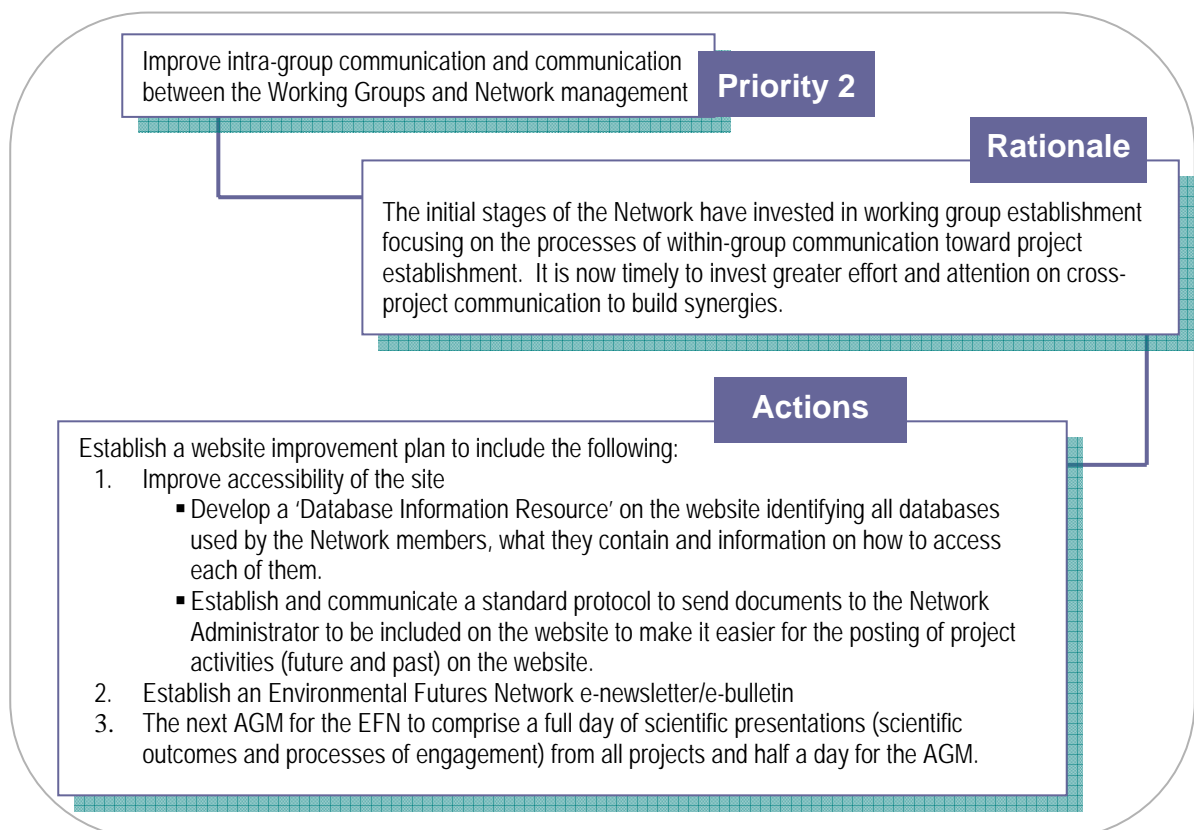
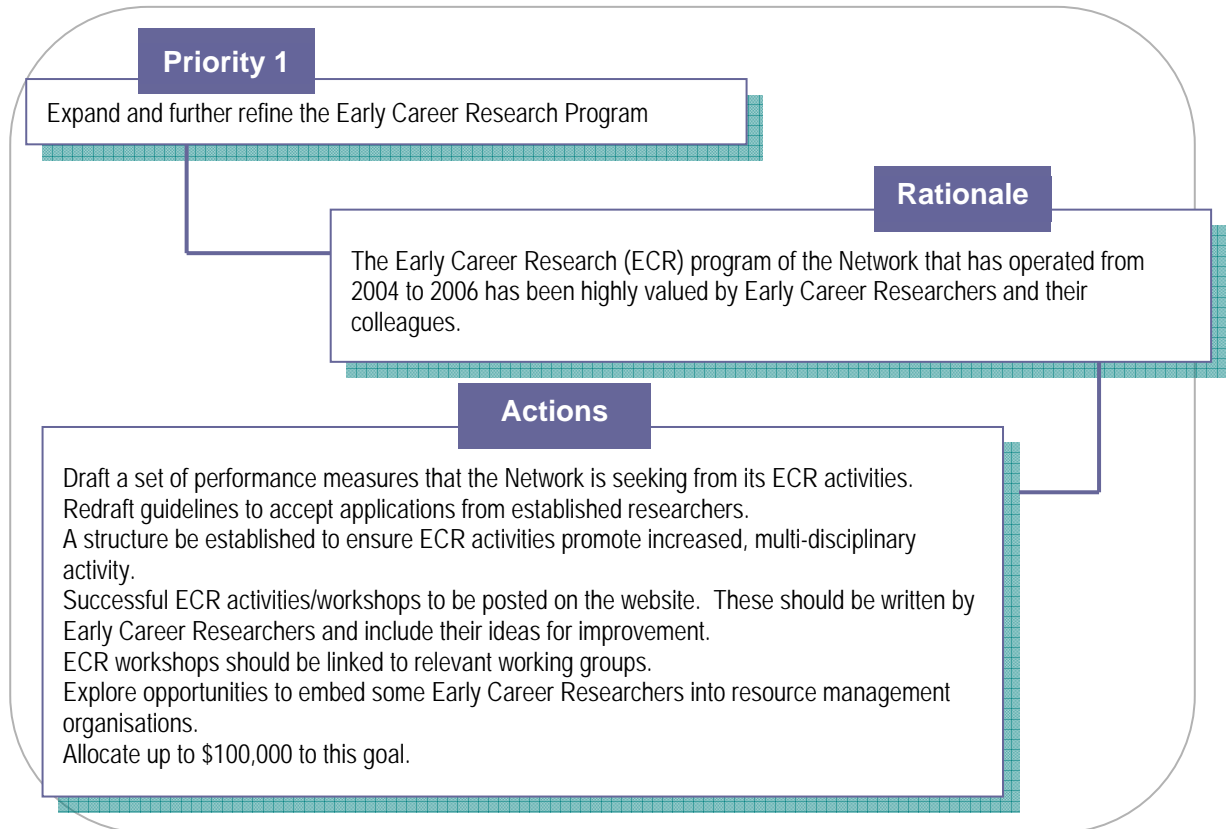
Projects that experienced deferred/delayed starts:

ERC Round 1	Applicant(s):	John Tibby
	Project Category:	Short course/workshop
	Project title:	Enhanced understanding of shallow lake ecology-interpreting sediment records of plant remains
	Funding awarded:	\$ 9, 863
This workshop was planned for January 2007 thus the final report will feature in the 2007 Annual Report.		

WGP Round 1	CI(s)	Sean Connell, University of Adelaide, School of Earth & Environmental Sciences
	Project title:	An ecological history of Australia's temperate marine environments: accounting for the shifting baseline syndrome
	Total Funding over 3 cycles:	\$90,000
Applicant requested to transfer the project to 2007 to enable meetings to be more cost effective (i.e. based in the USA within budget with the support of US funds).		

The Network ran a two day AGM/Strategic Workshop in January 19 & 20, 2007 at the Botanic Garden attended by 22 CI members and 3 invited guests. Two guest speakers were invited to target two of the Network's original objectives – Science in the Media and E-Research. Guest speakers were Prof AhChung Tsoi, Monash University; Robert Morrison, Flinders University; and Raymond Nias, WWF.

Mark Douglas from Ethos Australia was engaged once again to facilitate the meeting and several strategic outcomes were presented by the participants. These will form the basis of the Executive Management Committee meetings during 2007 – assessing and establishing those that support the Network's objectives and goals.



Priority 3

Confirm and communicate Network Performance Measures

Rationale

Clear performance measures for the Working Groups and the Network have not been clearly expressed since funding of 60 % of the original proposal.

Actions

Develop and communicate a list of key performance measures for the Working Groups

Priority 4

Consider the Nature of the Environmental Futures Network Post ARC Funding

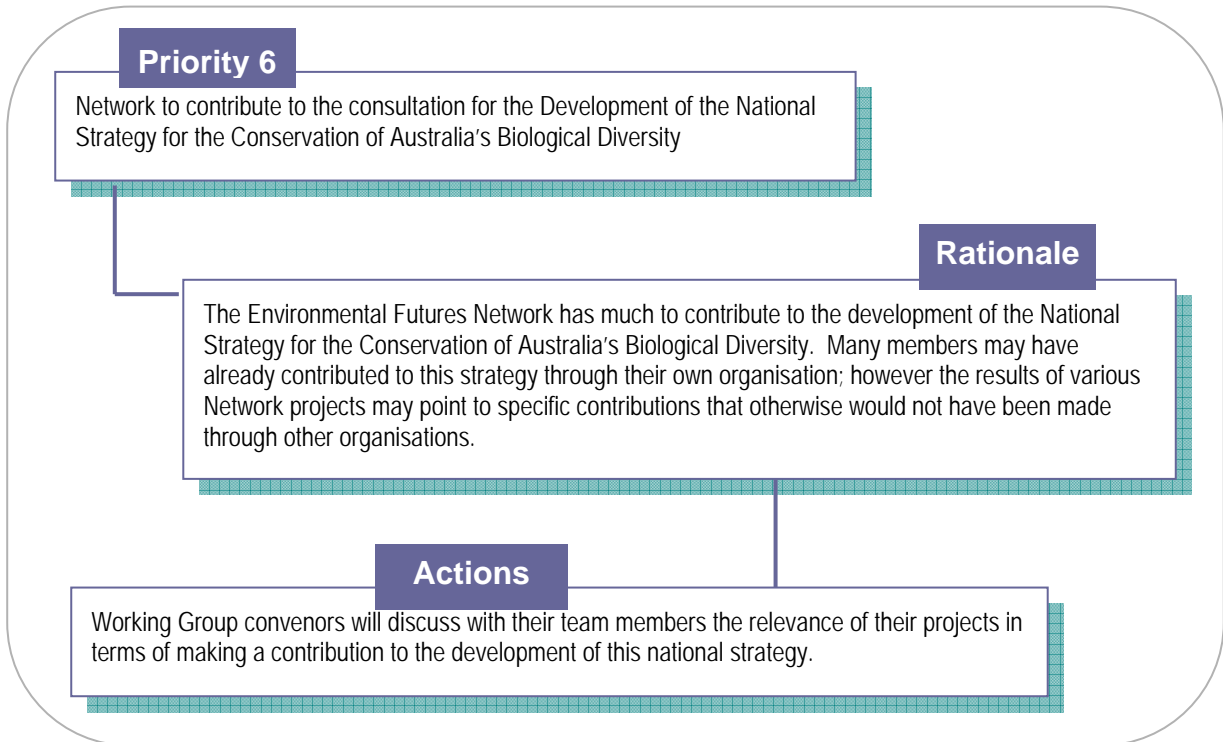
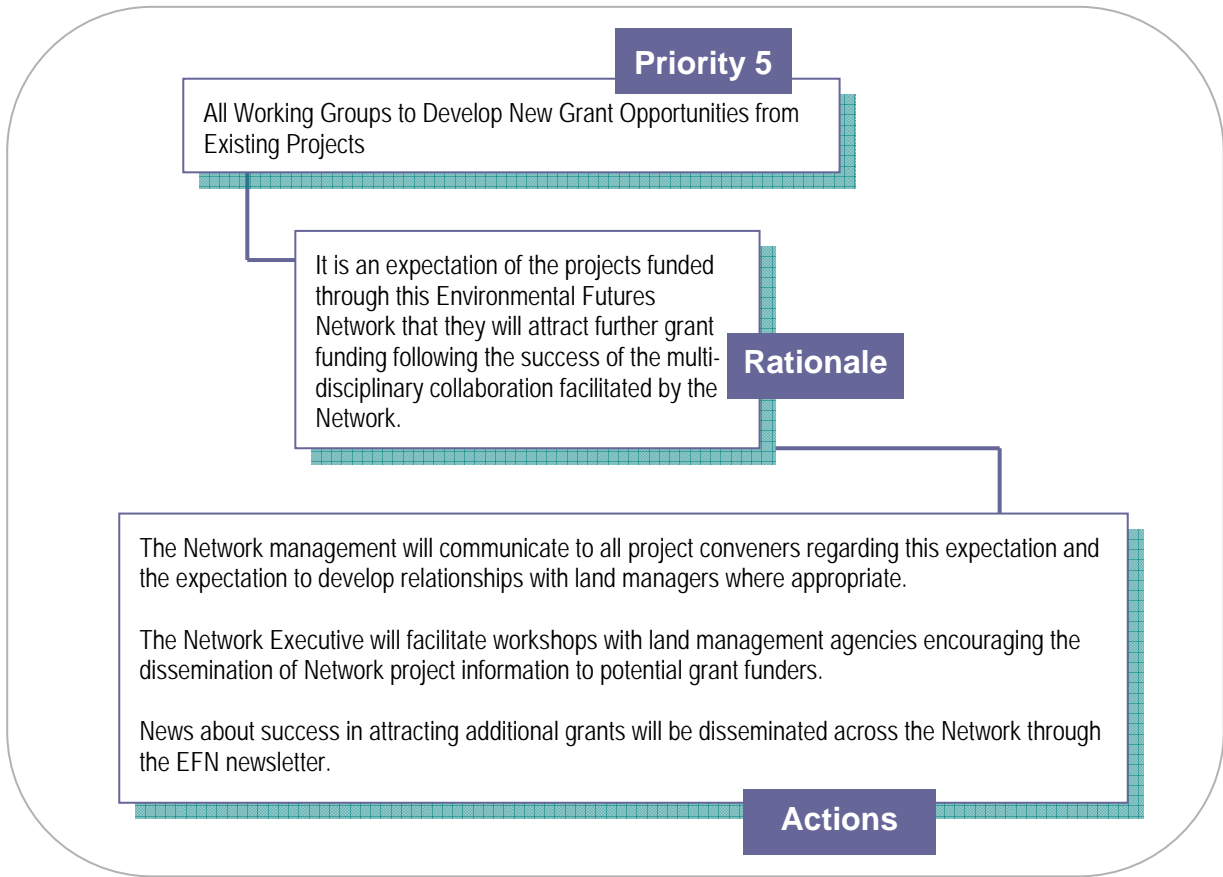
Rationale

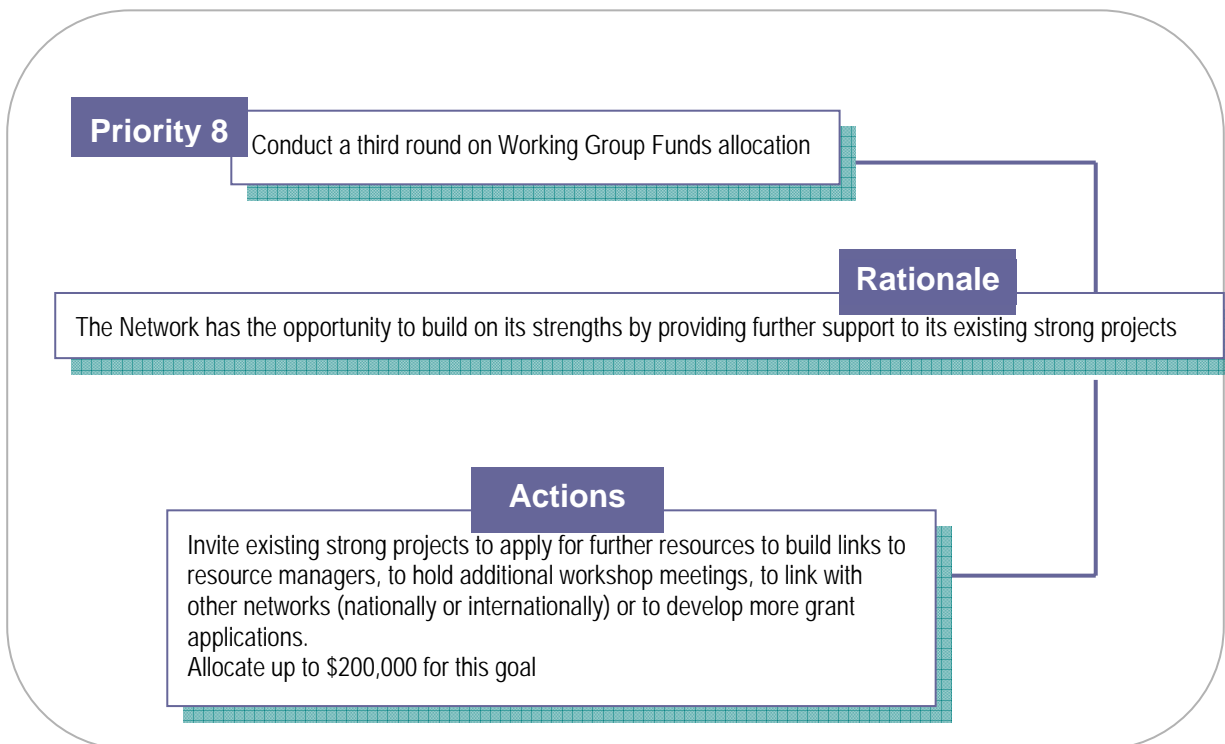
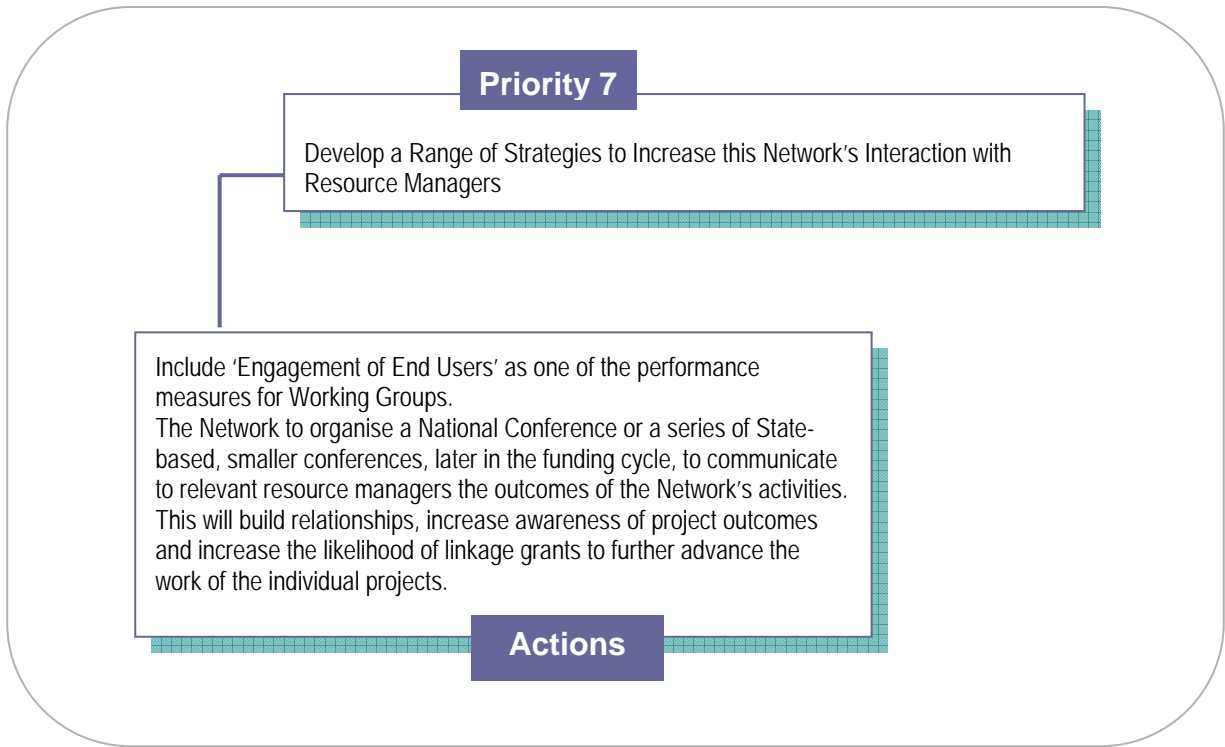
The opportunity presented by the ARC Network has led some people to consider the continuation of aspects of the Network after the five years of funding has been completed

Actions

Fund a feasibility study for the development of a comprehensive, independently-hosted website to operate post ARC funding, to facilitate the continued interaction of Network members.

The Executive Committee will consider the various options for the Network after the ARC funding and prepare a Discussion Article to appear in the EFN Newsletter.





Register of research network participants - Attachment 1

No	Title	Surname	First name	Department	Institution	Country	Highest Qual.	Year	Member Type
1		Abdulla	Ameer		James Cook University	Australia			PhD
2	Dr	Adams	Michael		University of Wollongong	Australia	PhD		P/doc
3		Alacs	Erica		University of Canberra	Australia			PhD
4	Mr	Amarathunga*	A. D.		National Aquatic Resource Research & Development Agency	Sri Lanka			
5	Dr	Andersen	Alan	Tropical Ecosystems Research Centre	CSIRO Sustainable Ecosystems	Australia	PhD	1985	M
6	Prof	Anderson	Athol	School of Pacific & Asian Studies	Australian National University	Australia			M
7		Andrew	Debbie		University of Wollongong	Australia			PhD
8	Dr	Attenbrow	Val	Anthropology	Australian Museum	Australia			M
9	Dr	Aubret*	Fabien	School of Biological Sciences	University of Sydney	Australia	PhD		M
10	Prof	Austin	Andrew	Centre for Evolutionary Biology & Biodiversity	University of Adelaide	Australia	PhD	1982	CI
11	Ms	Badstuebner*	Jennifer		Australian national University	Australia			PhD
12	Dr	Baird	Andrew		James Cook University	Australia	PhD		P/doc
13	Dr	Baker	Andrew	School of Natural Resource Sciences	Queensland University of Technology	Australia			M
14		Banks	Sam		Monash University	Australia			PhD
15	Dr	Barbour	Robert		University of Tasmania	Australia	PhD		P/doc
16		Barker	Jenny		University of Adelaide	Australia			PhD
17		Barr	Cameron		University of Adelaide	Australia			PhD
18	Prof	Baverstock	Peter	Pro-Vice Chancellor (Research)	Southern Cross University	Australia	DSc	1989	CI
19		Bay	Line		James Cook University	Australia			PhD
20		Beavis	Amber		Australian National University	Australia			PhD
21	Ms	Beeby	Rosslyn	Journalist	Canberra Times	Australia	-	-	M
22		Bell	Karen		University of Queensland	Australia			
23	Prof	Bellwood	David	Centre for Coral Reef Biodiversity	James Cook University	Australia	PhD	1986	CI
24	Dr	Bennett	Andrew	School of Biological Sciences	University of Bristol	England	PhD	1991	M
25	Dr	Berg	Matthew		University of Bristol	England	PhD		P/doc
26	Dr	Bestland	Erick	School of Chemistry, Physics & Earth Sciences	Flinders University	Australia	PhD		M
27	Dr	Blackett	Mark		La Trobe University	Australia	PhD		P/doc
28		Bode	Michael		University of Queensland	Australia			PhD
29	Dr	Bone	Yvonne	School of Earth & Environmental Sciences	University of Adelaide	Australia			M
30	Dr	Bourke	Patricia	School of Australian Indigenous Knowledge Systems	Charles Darwin University	Australia	PhD		M
31	Prof	Bowler	Jim	School of Earth Sciences	University of Melbourne	Australia	PhD	1970	CI
32	Prof	Bowman	David	Key Centre for Tropical Wildlife Management	Charles Darwin University	Australia	DSc	2001	CI

No	Title	Surname	First name	Department	Institution	Country	Highest Qual.	Year	Member Type
33		Braccini	Juan		University of Adelaide	Australia			PhD
34	Dr	Brook	Barry	Key Centre for Tropical Wildlife Management	Charles Darwin University	Australia	PhD	1999	CI
35	Dr	Brown	Gregory		University of Sydney	Australia	PhD		P/doc
36		Brown	Jonathan		Monash University	Australia			PhD
37		Bulpin	Sorell		University of Adelaide	Australia			PhD
38	Dr	Bustamante	Rodrigo	Northern Fisheries & Ecosystems Research Gp	CSIRO	Australia	PhD	1994	M
39	Dr	Butler	Alan	Torres Strait Marine Resources	CSIRO	Australia	PhD	1972	CI
40	Dr	Byrne	Margaret		CALM, WA	Australia	PhD	1992	CI
41	Dr	Byrne	Phil		Australian National University	Australia	PhD		P/doc
42		Caldwell	Katherine		University of Adelaide	Australia			PhD
43	Mr	Camens*	Aaron	School of Earth & Environmental Sciences	University of Adelaide	Australia			PhD
44		Cameron	Sue		University of California	USA			PhD
45	Dr	Cantrill	David	Department of Sustainability & Environment	National Herbarium of Victoria	Australia			M
46		Carew	Melissa		La Trobe University	Australia			PhD
47	Dr	Chapman	Thomas		Flinders University	Australia	PhD		P/doc
48	Prof	Chappell	John	Research School of Earth Sciences	Australian National University	Australia	PhD	1973	CI
49		Chapple	David		Australian National University	Australia			PhD
50	A/Prof	Christidis	Les	Sciences Department	Museum Victoria	Australia	PhD	1985	M
51		Clark	Ellen		Flinders University	Australia			PhD
52		Clarke	Simon		University of Wollongong	Australia			PhD
53		Cobiac	Linda		University of Queensland	Australia			PhD
54	Ms	Colreavy	Mary#	Australian Biological Resources Study	Department of Environment and Heritage	Australia	Grad Cert	1998	CI
55	Dr	Connell	Sean	School of Earth & Environmental Sciences	University of Adelaide	Australia	PhD	1994	CI
56	Dr	Connolly	Sean	Centre for Coral Reef Biodiversity	James Cook University	Australia	PhD	1999	CI
57	Dr	Cook*	Ellyn		Monash University	Australia	PhD		M
58	Prof	Cooper	Alan	Department of Zoology	University of Oxford	England	PhD	1994	CI
59	Dr	Cooper	Steve	Evolutionary Biology Unit	South Australian Museum	Australia	PhD	1991	M
60		Cox	Justine		University of Wollongong	Australia			PhD
61		Crouch	Joe		Monash University	Australia			PhD
62	Prof	Crozier	Ross	School of Tropical Biology	James Cook University	Australia	PhD	1969	CI
63	Dr	Cupper	Matt	School of Earth Sciences	University of Melbourne	Australia	PhD	2003	M
64	Dr	David	Bruno	School of Geography & Environmental Science	Monash University	Australia	PhD	1994	CI
65		Denham	Tim	School of Geography & Environmental Science	Monash University	Australia	PhD		M
66		Depscyznski	Martial		James Cook University	Australia			PhD
67	Dr	Dixon	Kingsley	-	Kings Park & Botanic Gardens, Perth	Australia	PhD	1981	M
68	Dr	Doelman	Trudy		University of Sydney	Australia	PhD		P/doc
69	Dr	Dolman	Gaynor		University of Queensland	Australia	PhD	2006	PhD

No	Title	Surname	First name	Department	Institution	Country	Highest Qual.	Year	Member Type
70		Donders	Timme		Utrecht University	The Netherlands			PhD
71	Prof	Donnellan	Steve	Evolutionary Biology Unit	South Australian Museum	Australia	PhD	1985	CI
72		Dornelas	Maria		James Cook University	Australia			PhD
73	Dr	Dortch	Joe		University of Sydney	Australia	PhD		P/doc
74	Dr	Driscoll	Don	School of Biological Sciences	Flinders University	Australia	PhD	1997	CI
75		Edwards	Danielle		University of Western Australia	Australia			PhD
76		Elsdon	Travis		University of Adelaide	Australia			PhD
77		Elwood	Cecilia		Monash University	Australia			PhD
78		Esparza Salas	Rodrigo		James Cook University	Australia			PhD
79	Dr	Faith	Daniel	Biodiversity & Systematics Unit	Australian Museum	Australia	PhD	1979	CI
80	Prof	Farquhar	Graham	Research School of Biological Sciences	Australian National University	Australia	PhD	1973	CI
81	Dr	Farrington*	Lachlan	School of Earth & Environmental Sciences	University of Adelaide	Australia	PhD	2004	M
82	Ms	Faast	Renate		University of Adelaide	Australia			PhD
83	Dr	Field	Judith	Department of Archaeology	University of Sydney	Australia	PhD	1996	M
84	Dr	Field	Scott	School of Earth & Environmental Sciences	University of Adelaide	Australia			P/doc
85	Dr	Fink	David	ANSTO Environment	Australia Nuclear Science and Technology Organisation	Australia	PhD	1987	M
86		Fitch	Alison		Flinders University	Australia			PhD
87	Dr	FitzSimmons	Nancy	Applied Ecology Research Group	University of Canberra	Australia	PhD		M
88	Prof	Flannery	Tim		South Australian Museum	Australia	PhD	1985	CI
89	Dr	Fluin	Jennie	School of Earth & Environmental Sciences	University of Adelaide	Australia	PhD		P/doc
90		Ford	Fred		James Cook University	Australia			PhD
91		Fordham	Damien		University of Canberra	Australia			PhD
92		Fowler-Walke	Meegan		University of Adelaide	Australia			PhD
93	Emerit. Prof	Frakes	Larry	Discipline of Earth Science	University of Adelaide	Australia	PhD	1964	M
94	Dr	Framenau	Volker		Western Australian Museum	Australia	PhD		P/doc
95		Fulton	Christopher		James Cook University	Australia			PhD
96	Dr	Gale	Stephen	School of Geosciences	University of Sydney	Australia	PhD		M
97		Garrick	Ryan		La Trobe University	Australia			PhD
98	Dr	Gell	Peter	Geographical & Environmental Studies	University of Adelaide	Australia	PhD	1997	M
99	Prof	Georges	Arthur	Applied Ecology Research Group	University of Canberra	Australia	PhD	1982	CI
100	Dr	Gillanders	Bronwyn	School of Earth & Environmental Sciences	University of Adelaide	Australia	PhD	1996	M
101		Glavinic	Ana		Flinders University	Australia			PhD
102	Dr	Grice	Kliti	Centre of Applied Organic Geochemistry	Curtin University of Technology	Australia	PhD		M
103		Gosper	Carl		University of Woollongong	Australia			PhD

No	Title	Surname	First name	Department	Institution	Country	Highest Qual.	Year	Member Type
104	Mr	Grantham*	Hedley	Ecology Centre	University of Queensland	Australia			M
105	Dr	Grove	Simon	Division of Forest Research & Development	Forestry Tasmania	Australia	PhD	2001	M
106		Guerin	Greg		University of Adelaide	Australia			PhD
107		Gunawardne	Nilanaga		University of Adelaide	Australia			PhD
108	Dr	Guzik*	Michelle	School of Earth & Environmental Sciences	University of Adelaide	Australia			
109	Dr	Haberle	Simon	Department of Archaeology & Natural History	Australian National University	Australia	PhD	1994	CI
110	A/ Prof	Hall	Jay	School of Social Sciences	University of Queensland	Australia	PhD	1979	M
111		Halt	Magda		University of Adelaide	Australia			PhD
112		Hansen	Birgita		Monash University	Australia			PhD
113	Dr	Harvey	Mark	Department of Terrestrial Invertebrates	Western Australian Museum	Australia	PhD	1983	M
114	Mr	Harrington*	Mark		James Cook University	Australia			PhD
115		Hauser	Cindy		University of Queensland	Australia			PhD
116		Heemstra	Simon		University of Woollongong	Australia			PhD
117	Prof	Heijnis	Henk	ANSTO Environment	Australia Nuclear Science and Technology Organisation	Australia	PhD	1992	M
118	Ms	Helfgott*	Ariella	School of Mathematical Sciences	University of Adelaide	Australia			PhD
119	Dr	Hickerson	Michael		University of California	USA	PhD		P/doc
120	Prof	Hill	Robert	School of Earth & Environmental Sciences	University of Adelaide	Australia	DSc	1997	CI
121		Hobbs	Jean-Paul		James Cook University	Australia			PhD
122	Prof	Hoffmann	Ary	Centre for Environmental Stress & Adaptation Research	La Trobe University	Australia	PhD	1984	CI
123		Hoogenboom	Mia		James Cook University	Australia			PhD
124	Dr	Hopkins*	Angas		Dept of Environment & Conservation	Australia			M
125	Dr	Hopper	Steve		Kings Park & Botanic Gardens, Perth	Australia	PhD	1978	M
126		Hoskin	Conrad		University of Queensland	Australia			PhD
127	Dr	Hugall	Andrew		University of Adelaide	Australia	PhD		P/doc
128	Prof	Hughes	Terry	Centre for Coral Reef Biodiversity	James Cook University	Australia	PhD	1984	CI
129	Dr	Hughes	Jane	Centre for Riverine Landscapes	Griffith University	Australia	PhD		M
130		Il-Kwon	Kim		Australian National University	Australia			PhD
131		Irving	Andrew		University of Adelaide	Australia			PhD
132	Dr	Itzstein-Davey*	Freea		Trinity College	UK	PhD		M
133	Mr	Jensen*	Michael	Institute of Applied Ecology	University of Canberra	Australia			PhD
134	Dr	Johnson	Chris	School of Tropical Biology	James Cook University	Australia	PhD	1986	CI
135		Johnston	Rochelle		Monash University	Australia			PhD
136	Dr	Jordan	Greg	School of Plant Science	University of Tasmania	Australia	PhD	1993	M
137	Dr	Joseph	Leo	Department of Biology	University of Pennsylvania	USA	PhD		M
138		Joseph	Liana		University of Queensland	Australia			PhD

No	Title	Surname	First name	Department	Institution	Country	Highest Qual.	Year	Member Type
139		Joyce	Narelle		Flinders University	Australia			PhD
140		Kassahn	Karin		James Cook University	Australia			PhD
141	Dr	Kear	Ben	School of Earth & Environmental Sciences	University of Adelaide	Australia			P/doc
142	Dr	Kearney	Michael		La Trobe University	Australia	PhD		P/doc
143		Kellerman	Vanessa		La Trobe University	Australia			PhD
144		Kendal	Trish		Monash University	Australia			PhD
145	Dr	Keogh	Scott	School of Botany & Zoology	Australian National University	Australia	PhD	1997	CI
146	Dr	Kerr	Alexander		James Cook University	Australia	PhD		P/doc
147	Prof	Kershaw	A. Peter	Centre for Palynology & Palaeoecology	Monash University	Australia	PhD	1973	CI
148		Kesner	Brian		James Cook University	Australia			PhD
149		Kononenko	Nina		Australian National University	Australia			PhD
150		Konow	Nicolai		James Cook University	Australia			PhD
151	Dr	Kosnick	Matthew		James Cook University	Australia	PhD		P/doc
152	Mr	Klaer	Neil	Division of Marine Research	CSIRO	Australia	M.Appl. Sc.	1999	M
153		Kristensen	Nadiyah		University of Queensland	Australia			PhD
154	Dr	Krull*	Evelyn	Land & Water	CSIRO	Australia			M
155		Lada	Hania		Monash University	Australia			PhD
156	Prof	Ladiges	Pauline	School of Botany	University of Melbourne	Australia	PhD	1975	CI
157	Dr	Lambkin	Christine	Australian National Insect Collection	CSIRO	Australia			P/doc
158		Lancaster	Melanie		La Trobe University	Australia			PhD
159	Ms	Lane*	Amanda	School of Biological Sciences	University of Sydney	Australia			PhD
160		Langkilde	Tracey		University of Sydney	Australia			PhD
161	Dr	LaSalle	John	Australian National Insect Collection	CSIRO	Australia	PhD	1984	M
162		Leahy	Paul		Monash University	Australia			PhD
163	Dr	Lee	Michael	School of Earth & Environmental Sciences	University of Adelaide	Australia	PhD	1995	CI
164	Prof	Li	Qianyu	School of Ocean & Earth Sciences	Tongji University	China	PhD	1991	M
165	Dr	Lilley	Ian	Aboriginal and Torres Strait Islander Studies Unit	University of Queensland	Australia	PhD	1987	CI
166	A/Prof	Lockhart	Peter	Allan Wilson Centre	Massey University	New Zealand	PhD	1990	CI
167	Prof	Lowe	Andrew	School of Earth & Environmental Sciences	University of Adelaide	Australia	PhD		M
168		Lukoschek	Vimoksalehi		James Cook University	Australia			PhD
169	Dr	Luly	Jon		James Cook University	Australia	PhD		M
170	Dr	Lydon	Jane	Centre for Australian Indigenous Studies	Monash University	Australia	PhD	2001	M
171	Prof	Lynch	Amanda	School of Geography & Environmental Science	Monash University	Australia	PhD	1993	M
172	Dr	MacDonald	David	National Ecological Sustainable Development Research Group	CSIRO	Australia	PhD	1987	M
173		Macgregor	Angus		University of Adelaide	Australia			PhD

No	Title	Surname	First name	Department	Institution	Country	Highest Qual.	Year	Member Type
174	Dr	Mackenzie	Jason		University of California	USA	PhD		P/doc
175		MacLeish	Michael		Flinders University	Australia			PhD
176	Dr	Macphail	Michael	RSPAS	Australian National University	Australia	PhD		M
177		Madin	Joshua		James Cook University	Australia			PhD
178	Dr	Masello	Juan		University of Bristol	England	PhD		P/doc
179		Martin	Tara		University of Queensland	Australia			PhD
180	Dr	McGowran	Brian	School of Earth & Environmental Science	University of Adelaide	Australia	PhD	1963	M
181	Dr	McKinnon	Gay	School of Plant Science	University of Tasmania	Australia			P/doc
182		Mcleod	Alex		Monash University	Australia			PhD
183	Dr	McNiven	Ian	School of Geography & Environmental Science	Monash University	Australia	PhD	1991	M
184		Mcveigh	Craig		University of Adelaide	Australia			PhD
185		Menke	Norbert		University of Queensland	Australia			PhD
186	Prof	Midgley	Jeremy	Department of Botany	University of Cape Town	South Africa	PhD	1986	M
187	Prof	Miller	Gifford	Centre for Geochronological Research	University of Colorado	USA	PhD	1975	CI
188	Mrs	Mohamed	Sapura						PhD
189		Mitrovski	Paul		La Trobe University	Australia			PhD
190		Mokany	Alison		Australian National University	Australia			PhD
191	Dr	Mooney	Scott	School of Biological, Earth & Environmental Sciences	University of NSW	Australia	PhD		M
192	Dr	Moore*	Ben		James Cook University	Australia	PhD		M
193		Morgan	Matthew		Australian National University	Australia			PhD
194	Prof	Moritz	Craig	Department of Integrative Biology	University of California at Berkeley	USA	PhD	1985	CI
195		Moretti	Ben		University of Adelaide	Australia			PhD
196		Moulds	Tim		University of Adelaide	Australia			PhD
197		Moussalii	Adnan		University of Queensland	Australia			PhD
198		Muirhead	Kate		University of Adelaide	Australia			PhD
199	Dr	Munday	Phil		James Cook University	Australia	PhD		P/doc
200	Dr	Murphy	Nic	School of Earth & Environmental Sciences	University of Adelaide	Australia	PhD		P/doc
201	Prof	Murray	Tim	Archaeology Program	La Trobe University	Australia			M
202		Nelson	Isobel		University of Bristol	England			PhD
203	Dr	Nias*	Raymond	Director of Conservation	WWF Australia	Australia	PhD		M
204	Dr	Nicholls	Neville	Bureau of Meteorology Research Centre	Bureau of Meteorology	Australia	PhD	1983	CI
205		Nicholson	Emily		University of Queensland	Australia			PhD
206		Nipperess	David		Macquarie University	Australia			PhD
207	Dr	O'Reilly-Wapstra*	Julianne		University of Tasmania	Australia			P/doc
208		Ottewell	Kym		University of Adelaide	Australia			PhD

No	Title	Surname	First name	Department	Institution	Country	Highest Qual.	Year	Member Type
209		Pantuis	Frances		University of Queensland	Australia			PhD
210	Dr	Park	Yung Chul		Flinders University	Australia	PhD		P/doc
211	Dr	Parr*	Jeff		Southern Cross University	Australia			P/doc
212	A/Prof	Paton*	David	School of Earth & Environmental Sciences	University of Adelaide	Australia	PhD		M
213		Paull	Cate		University of Adelaide	Australia			PhD
214		Paull	Rosemary		University of Adelaide	Australia			PhD
215		Pavlova	Alexandra		Monash University	Australia	PhD		PhD
216	Dr	Pearson	Stuart	Geography & Environmental Science	University of Newcastle	Australia			M
217	Ms	Pert*	Petina	GIS Landscape Ecology	CSIRO	Australia			PhD
218		Phillips	Ben		University of Sydney	Australia			PhD
219		Piggott	Maxine		Monash University	Australia			PhD
220		Piromvagon	Srisakul		James Cook University	Australia			PhD
221		Porch	Nick		Monash University	Australia			PhD
222	Prof	Possingham	Hugh	Departments of Zoology & Mathematics	University of Queensland	Australia	PhD	1987	CI
223	A/Prof	Potts	Brad	School of Plant Science	University of Tasmania	Australia	PhD	1983	CI
224	Prof	Powell	Wayne	School of Agriculture & Wine	University of Adelaide	Australia	PhD	1985	M
225	Dr	Pratchett	Morgan		James Cook University	Australia	PhD		P/doc
226	Dr	Prebble*	Matthew	Dept. of Archaeology & Natural History	Australian national University	Australia	PhD		M
227	Prof	Prescott	John	Physics Department	University of Adelaide	Australia	PhD	1969	M
228	Mr	Price*	Luke	School of Earth & Environmental Sciences	University of Adelaide	Australia	PhD		PhD
229		Quinn	Alex		University of Canberra	Australia			PhD
230	Dr	Radd*	Rajkumar	School of Biological Sciences	University of Sydney	Australia	PhD		M
231		Raadik	Tarmo		University of Canberra	Australia			PhD
232	Prof	Ranganathan	Shoba	Biotechnology Research Institute	Macquarie University	Australia	PhD	1983	M
233		Rath	Pip		University of Sydney	Australia			PhD
234	Mr	Rawlence*	Nic	School of Earth & Environmental Sciences	University of Adelaide	Australia			PhD
235		Read	Charmaine		James Cook University	Australia			PhD
236	A/Prof	Read	Jennifer	School of Biological Sciences	Monash University	Australia	PhD		M
237		Rhodes	Jonathan		University of Queensland	Australia			PhD
238	Dr	Rich	Tom	Vertebrate Palaeontology	Museum Victoria	Australia	PhD	1973	M
239	Ms	Richter*	Anette		University of Canberra	Australia			PhD
240		Ritchie	Euan		James Cook University	Australia			PhD
241	A/Prof	Roberts	Richard	School of Earth & Environmental Sciences	University of Wollongong	Australia	PhD	1991	CI
242	Dr	Rouse	Gregory	Marine Invertebrates Section	South Australian Museum	Australia	PhD	1991	CI
243		Rowe	Cassandra	Dept of Archaeology & Natural History	Monash University	Australia			PhD
244		Rule	Susan		Monash University	Australia			PhD
245	Dr	Runciman	David		La Trobe University	Australia	PhD		P/doc

No	Title	Surname	First name	Department	Institution	Country	Highest Qual.	Year	Member Type
246		Sands	Chester		La Trobe University	Australia			PhD
247		Schmuki	Christina		La Trobe University	Australia			PhD
248	A/Prof	Schwarz	Michael	School of Biological Sciences	Flinders University	Australia	PhD	1987	M
249		Sharp	Hayley		Australian National University	Australia			PhD
250	Prof	Shine	Rick	School of Biological Sciences	University of Sydney	Australia	DSc	1989	CI
251	Dr	Silberbauer	Letitia		Macquarie University	Australia	PhD		P/doc
252		Simpkins	Scott		Flinders University	Australia			PhD
253		Skinner	Adam		University of Adelaide	Australia			PhD
254	Prof	Spriggs	Matthew	School of Archaeology & Anthropology	Australian National University	Australia	PhD	1981	CI
255		Slack	Michael		University of Sydney	Australia			PhD
256		Slatyer*	Cameron		Australian Biological Resources Study	Australia			
257		Smith	Peter		Macquarie University	Australia			PhD
258		Smith	Warwick		Australian National University	Australia			PhD
259		Sniderman	J		Monash University	Australia			PhD
260		Stamati	Konstantina		University of Dundee	Scotland			PhD
261		Stapley	Jessica		Australian National University	Australia			PhD
262	Dr	Steane	Dorothy	School of Plant Science	University of Tasmania	Australia	PhD		M
263		Stevens	Nick		University of Adelaide	Australia			PhD
264		Stevens	Tanya		University of Wollongong	Australia			PhD
265	Dr	Stow	Adam		Macquarie University	Australia	PhD		P/doc
266	Dr	Sunnucks	Paul	Department of Genetics	La Trobe University	Australia	PhD	1995	CI
267	Dr	Symonds	Matthew		James Cook University	Australia	PhD		P/doc
268	Dr	Taylor	Andrea	School of Biological Sciences	Monash University	Australia	PhD	1996	CI
269		Taylor	Duncan		Flinders University	Australia			PhD
270	Dr	Tibby	John	School of Earth & Environmental Sciences	University of Adelaide	Australia			P/doc
271		Tierney	Simon		Flinders University	Australia			PhD
272	Dr	Torrence	Robin	Anthropology	Australian Museum	Australia	PhD	1981	CI
273		Tsitsilas	Angelos		La Trobe University	Australia			PhD
274	Dr	Turney	Christian	School of Earth & Environmental Sciences	University of Wollongong	Australia	PhD	1998	CI
275	Mr	Tye*	Angus		University of Melbourne	Australia			PhD
276	Dr	Uller	Tobias		University of Wollongong	Australia			P/doc
277		Ulm	Sean		University of Queensland	Australia			PhD
278		Valentine	Leonie		James Cook University	Australia			PhD
279	Dr	Venables	Bill	Mathematics & Information Sciences	CSIRO	Australia	PhD	1973	M
280	Dr	Veth	Peter		AIATSIS	Australia			M
281		Vytopil	Elaine		University of Adelaide	Australia			PhD
282	Ms	Wahlquist	Asa	Rural Writer	The Australian Newspaper	Australia	BAGSc	1987	M

No	Title	Surname	First name	Department	Institution	Country	Highest Qual.	Year	Member Type
283		Walker	Faith		Monash University	Australia			PhD
284	Dr	Walker-Smith	Genefer		Tasmanian Museum & Art Gallery	Australia			P/doc
285		Wall	Michael		University of Sydney	Australia			PhD
286		Warner	Daniel		University of Sydney	Australia			PhD
287	Dr	Webb	Jonathon		University of Sydney	Australia			P/doc
288	Dr	Weeks	Andrew		La Trobe University	Australia			P/doc
289		Wells	Jessie		University of Queensland	Australia			PhD
290	Dr	West	Judy	Australian National Herbarium	CSIRO Plant Industries	Australia	PhD	1981	CI
291	Prof	Westoby	Mark	Department of Biological Sciences	Macquarie University	Australia	PhD	1973	CI
292	Dr	Weston*	Peter		Royal Botanic Gardens & Domain Trust	Australia	PhD		M
293	Prof	Whelan	Rob	Faculty of Science	University of Wollongong	Australia	PhD	1978	CI
294	Mr	While*	Geoff	School of Zoology	University of Tasmania	Australia			PhD
295		White	Christopher		Monash University	Australia			PhD
296	Dr	Wilcox	Chris		University of Queensland	Australia	PhD		M
297	Dr	Willerslev	Eske		University of Oxford	England			
298	Prof	Williams	Martin	Geographical & Environmental Studies	University of Adelaide	Australia	DSc	1996	CI
299		Williams	Yvette		James Cook University	Australia			PhD
300	Dr	Wills	Karen		University of Tasmania	Australia	PhD		P/doc
301		Wilson	Nerida		University of Queensland	Australia			PhD
302		Wilson-Wilde	Linzi		University of Canberra	Australia			PhD
303	Dr	Wintle*	Brendan	Applied Decision Analysis	University of Melbourne	Australia	PhD		M
304	Dr	Woodhead	Mary		SCRI	Scotland	PhD		P/doc
305	Dr	Wormington	Kevin	Centre for Environmental Management	Central Queensland University	Australia	PhD	2003	M
306		Worth	James		University of Tasmania	Australia			PhD
307	Dr	Yeates	David	Australian National Insect Collection	CSIRO	Australia	PhD	1988	CI
308		Zammit	John		Flinders University	Australia			PhD
309		Zwick	Andreas		Australian National University	Australia			PhD

*New member to the Network in 2006 to date of annual report publication

Left institution and position of Director taken over by Cameron Slatyer

Names of participants in funded Working Groups Projects - Attachment 2

Project 1		
Coping with Change: Resilience of Marine Social-Ecological Systems		
Participant	Institution	Expertise
Terry Hughes (CI)	James Cook University	Macroecology
Carl Folke	Stockholm University	Ecological economics
Brian Walker	CSIRO Sustainable Ecosystems	Sustainable ecosystems
Tim Lynham	CSIRO Healthy Country	Landscape ecology
Andrew Baird	James Cook University	Coral reef biology
Lance Gunderson	Emory University, Atlanta	Social science, property rights
Fikret Berkes	University of Manitoba	Adaptive governance
Ariella Helfgott	University of Adelaide	Mathematical modelling
Heidi Schuttenberg	GBRMPA	Resilience in coral reef systems
Per Olsson	Stockholm University	Social-ecological systems
John Norberg	Beijer Institute, Sweden	Systems ecology, modelling
Marten Scheffer	Wageningen University, Holland	Aquatic ecology, water management
Bob Steneck,	University of Maine	Regime shifts
Jim Wilson	University of Maine	Fisheries economist
Project 2		
Recent Human Impact on Australian Ecosystems		
Participant	Institution	Expertise
Peter Gell (CI)	University of Adelaide	Lake palaeolimnology, diatoms
Scott Mooney	University of New South Wales	Charcoal & fire history, palynology
Henk Heijnis	ANSTO	Pb/Cs dating, President of AQUA
Tim Denham	Monash University ⁶	Archaeology, ethnohistory
Cameron Barr	University of Adelaide	Recent climate change
Tim Barrows	ANU	Australian Quaternary data base
Rick Battarbee	University College London, UK	Director of Focus V LIMPACS
Sophie Bickford	CSIRO Plant Industry	GIS, palynology, myrtaceae
John Dearing	University of Liverpool, UK	Leader of Focus V, Leader of HITE
John Dodson	Brunel University, UK	Palynology, rate of change analysis
Jennie Fluin	University of Adelaide	Murray River palaeolimnology
Stephen Gale	Sydney University	Sedimentology
Adriana Garcia	University of Wollongong	Forams, charophytes
Simon Haberle	ANU	Palynology, climate
Gary Hancock	CSIRO Land & Water	Pb/Cs dating
Kate Harle	CSIRO Sustainable Ecosystems	Palynology, climate
Geoff Hope	ANU	Peatland palynology, fire
Peter Kershaw	Monash University	Palynology, fire history
Ralph Ogden	University of Canberra	Fossil macroinvertebrates
Nick Porch	Monash University	Macrophyte fossils, coleoptera
Janet Pritchard	Arthur Rylah Institute, DSE	Fish otoliths
Lynda Radke	Geoscience Australia	Ostracods; ionic chemistry, estuaries
Michael Reid	University of Canberra	Billabong palaeolimnology
Katherine Taffs	Southern Cross University	Estuary paleolimnology
Ian Thomas	University of Melbourne	Palynology, charcoal
John Tibby	University of Adelaide	Statistics, estuary palaeolimnology
Project 3		
Project Title: Multidisciplinary Approaches to Key Australian Biodiversity Challenges of 2010 and beyond		
Participant	Institution	Expertise
Dan Faith (CI)	Australian Museum	Biodiversity, sustainability
Simon Ferrier	Dept Environment and Conservation	Biodiversity, Modelling, GIS, planning
H. Cogger	Australian Museum	Herpetology
Mike Crisp	ANU	Plant biogeography, systematics
Roz Crozier	James Cook University	Genetics, phylogeny
David Yeates	CSIRO, Insects	Insect Systematics, biodiversity
K. Williams	CSIRO, Geography	Geography, national environmental audit

Chris Margules	CSIRO, Conservation	Conservation planning
Craig Moritz	University of California, Berkeley	Animal phylogeography
Margaret Byrne	CALM, WA	Plant phylogeography
Gary Richards	Australian Greenhouse Office	Databases and modelling for land-use change and carbon storage
G. Wilson	Australian Museum	Marine biodiversity
Barry Brook	Charles Darwin University	Biodiversity and extinction research
Susan Cameron	University of California, Berkeley	Climate change
J. Trueman	ANU	Bioinformatics, systematics
Stuart Pearson	Dept Land & Water	Land and water planning/management
Project 4	Plant exploitation and domestication east of the Wallace Line: Movement, manipulation and management of plant biodiversity	
Participant	Institution	Expertise
Tim Denham (CI)	School of Geography & Environmental. Science, Monash University	Archaeology, ethnohistory
Mike Bourke	ANU	Agronomy
David Bowman	Charles Darwin University	Ecology/Biodiversity
Javier Caballero	Universidad Nacional Autonoma de Mexico	Ethnobiology
Peter Matthews	National Musuem of Ethnology, Osaka	Food plant ecology, aroids
Richard Cosgrove	La Trobe University	Archaeology, archaeobotany
Lyn Craven	Australian national Herbarium	Ecology, taxonomy
Jeff Daniells	Queensland Dept Primary Industry	Agronomy, bananas
Bruno David	Monash University	Australian archaeology
Tim Denham	Monash University	Archaeology, palaeoagronomy
Andrew Fairbairn	ANU	Archaeobotany
Beth Gott	University of Melbourne	Ethnobotany
Brian Gunn	CSIRO Canberra	Ethnobotany
Simon Haberle	ANU	Palaeoecology
Martin Jones	Cambridge University	Archaeology, botany, ancient DNA
Vincent Lebot	CIRAD, Vanuatu	Genetics, food plants
Carol Lentfer	University of Queensland	Archaeobotany, palaeoecology
Dolores Piperno	Smithsonian Tropical Research Institute, Panama	Archaeobotany, palaeoecology
Matiu Prebble	ANU	Archaeobotan, palaeoecology
Sue Rule	Monash University	Archaeobotan, palaeoecology
Robin Torrence	Australian Museum	Archaeology
Project 5	Land-Ocean correlation of long Quaternary records from the southern hemisphere on orbital and sub-orbital timescales	
Participant	Institution	Expertise
Peter Kershaw (CI)	Monash University	Palaeoecology, palaeoclimatology
Tim Barrows	ANU	Marine isotope stratigraphy and palaeoclimatology, dating
Chris Turney	University of Wollongong	Carbon isotopes, dating
Paul Hesse	Macquarie University	Sedimentology, dust
Raphael Wust	James Cook University	Geochemistry
Will Howard	University of Tasmania	Marine palaeontology and palaeoclimatology
Manda Lynch	Monash University	Climate modelling
Martin Williams	University of Adelaide	Sedimentology and stratigraphy
Jim Bowler	Melbourne University	Sedimentology and stratigraphy
John McGee	ANU	Arid land sedimentology
Sander van der Kaars	Monash University	Palynology
Bert Roberts	University of Wollongong	OSL dating
Patrick De Deckker	ANU	Marine and freshwater palaeontology
Steve Clemens	Brown University	Marine palaeontology, spectral analysis
Nick Porch	Monash University	Fossil beetles, palaeoclimatology
Simon Haberle	ANU	Palynology
Kale Sniderman	Monash University	Palynology
Sarah Davies	Queens University, Belfast	Tephrochronology
Kate Harle	CSIRO Canberra	Palynology
Giff Miller	University of Colorado	AAR, climate modelling

Brad Opdyke	ANU	Marine isotope stratigraphy
Richard Wardle	Monash University	Climate modelling
Project 6	An Ecological History of Australia's Temperate Marine Environments: Accounting for the Shifting Baseline Syndrome	
Participant	Institution	Expertise
Sean Connell (CI)	University of Adelaide	Ecology, quantitative analytical techniques
Bronwyn Gillanders (CI)	University of Adelaide	Ecology
Simon Hart# (CI)	University of Adelaide	Ecology
Tony Pitcher	University of British Columbia	Palaeoecology, archaeology, ecological history
Robert Steneck	University of Maine	Palaeoecology, archaeology, ecological history
Alan Chivas	University of Wollongong	Palaeoecology
Peter Gell	University of Adelaide	Palaeoecology
David Neil	University of Queensland	Palaeoecology, ecological history
Val Attenbrow	Australian Museum	Archaeology
Don Garden	University of Melbourne	Archaeology, ecological history
Neil Klaer	CSIRO Marine Research	Ecological history, ecology
Rod Connolly	Griffith University	Ecology
Gary Kendrick	University of Western Australia	Ecology
Craig Johnson	University of Tasmania	Ecology
Tim Ward	SA Research & Development Institute	Ecology
Roger Bradbury	ANU	Quantitative analytical techniques
Project 7	Integrating historical, ecological, molecular and geographic data to reconcile Australian biotic radiations – using eucalypts and songbirds as a case study	
Participant	Institution	Expertise
David Bowman(CI)	Charles Darwin University	Ecology and biogeography
Barry Brook	Charles Darwin University	Modelling and ecology
Carmen Crossing	Charles Darwin University	Research Assistant/Support
Les Christidis	Australian Museum	Avian evolution
Peter Baxter#	University of Queensland	Modelling
Mike Crisp	Australian National University	Phylogeography and systematics
Simon Haberle	Australian National University	Palaeoecology, palynology and charcoal records
Chris Johnson	James Cook University	Vertebrate evolution and plant animal relationships
Pauline Ladiges	Melbourne University	Eucalypt evolution
Lyn Cook	Australian National University	Speciation; biogeography and phylogeography
Janette Norman	Museum of Victoria	Molecular ecology and avian evolution
Brendan Mackey	Australian National University	Biogeography and domain analysis
Brad Potts	University of Tasmania	Eucalypt evolution
Kale Sniderman#	Monash University	Palaeoecology, palynology and charcoal records
Matt McGlone	Landcare, New Zealand	Palaeoecology of New Zealand, comparative ecology between NZ and Aust.
Mark Westoby	Macquarie University	Comparative ecology and evolution of plant function
Bob Hill	University of Adelaide	Historical biogeography palaeoecology of southern hemisphere floras
Project 8	Evolutionary history of the Australian biota	
Participant	Institution	Expertise
Alan Andersen	CSIRO Sustainable Ecosystems	Invertebrates
Ken Aplin	CSIRO	Mammal phylogeny
Mike Bayley#	University of Melbourne	Plant phylogeny
Jim Bowler	University of Melbourne	Paleoenvironments
David Bowman (CI)	Charles Darwin University	Biogeography
Lindell Bromham	Univ. Sussex	Methods
Gillian Brown	University of Melbourne	Acacia phylogeny
Margaret Byrne (CI)#	CALM	Plant phylogeography
John Chappell	Australian National University	Geomorphology
Lyn Cook	Australian National University	Invertebrates, vertebrates, methods
Steve Cooper#	South Australian Museum	Invertebrate evolution
Ross Crozier	James Cook University	Invertebrate evolution
Mike Crisp	Australian National Uni.	Plant phylogeny, methods
Steve Donnellan	South Australian Museum	Vertebrates

Don Driscoll	Flinders University	Animal phylogeography
Scott Edwards	Harvard University	Avian evolution
Dan Faith	Australian Museum	Methods, Invertebrates, Conservation
Simon Haberle	Australian National University	Palynology
Mark Harvey	Western Australian Museum	Invertebrates
Bob Hill	University of Adelaide	Palaeoenvironments
Andrew Hugall#	South Australian Museum	Invertebrates, vertebrates, methods
Jane Hughes	Griffith University	Freshwater animal phylogeography
Greg Jordan	University of Tasmania	Plant palaeontologist
Leo Joseph	CSIRO	Avian phylogeny
Scott Keogh#	Australian National University	Vertebrates
Peter Kershaw	Monash University	Palaeoenvironments
Pauline Ladiges	University of Melbourne	Plant phylogeny
Chris. Lambkin	CSIRO Entomology	Invertebrates
Mike Lee#	The University of Adelaide	Vertebrates, Methods
Remko Leijs	South Australian Museum	Invertebrates
Andrew Lowe#	South Australian Herbarium	Plant phylogeny, phylogeography
Michael Macphail	Australian National University	Palynology
Gay McKinnon#	University of Tasmania	Plant phylogeny, phylogeography
Craig Moritz	UC Berkeley	Vertebrates
Dan Murphy#	University of Melbourne	Acacia phylogeny
Nic Porch#	Monash University	Palaeontology
Dan Rabosky	Cornell University	Methods
Michael Schwarz	Flinders University	Invertebrates
Dorothy Steane(CI)#	University of Tasmania	Plant phylogeny
Paul Sunnucks#	Monash University	Invertebrate evolution
René Vaillancourt	University of Tasmania	Plant phylogeography
Martin Williams	University of Adelaide	Quaternary geologist
David Yeates (CI)	CSIRO Entomology	Invertebrates, methods

Project 9 Human-land interactions of Australia's earliest inhabitants: adaptation and impact

Participant	Institution	Expertise
Harry Allen	University of Auckland*	Archaeology
Tim Barrows#	Australian National University	Geochronology
Mike Barbetti	University of Sydney	Geochronology
Heather Builth#	Monash University	Archaeology
Richard Cosgrove	LaTrobe University	Archaeology
Jim Bowler (CI)	University of Melbourne	Geology
Matt Cupper (CI)#	University of Melbourne	Palaeoecology, archaeology, geology
Kirsty Douglas#	Dept Environment and Heritage	Archaeology, geomorphology
Richard Gillespie	Australian National University	Geochronology
Rainer Grün	Australian National University	Geochronology
Simon Haberle	Australian National University	Palaeoecology, Archaeology
Jeanette Hope	La Trobe University	Archaeology, paleontology
Harvey Johnston	NSW Environ and Conservation	Archaeology
Justine Kemp#	Northumbria University*	Geomorphology
Isobell McBryde	Australian National University	Archaeology
John Magee	Australian National University	Geomorphology
Tim Murray (CI)	La Trobe University	Archaeology
Jon Olley	CSIRO Land & Water	Geochronology
Meredith Orr	Monash University	Geomorphology, palaeohydrology
Colin Pardoe		Palaeoanthropology
Ed Rhodes	Australian National University	Geochronology
Bert Roberts	Wollongong University	Geochronology
Richard Robins	University of New England	Archaeology
June Ross	University of New England	Archaeology
Ian Thomas	University of Melbourne	Palaeoecology
Alan Thorne	Australian National University	Palaeoanthropology
Wilfred Shawcross	Australian National University	Archaeology
Mike Smith	National Museum of Australia	Archaeology
Steve Webb	Bond University	Palaeoanthropology
Michael Westaway#	Dept Environment and Heritage	Palaeoanthropology

Project 10		Relief v Antarctic Ice: Passive or active drivers of Cenozoic climatic change	
Participant	Institution	Expertise	
Peter Barrett	Victoria University, Wellington	Antarctica history	
Tim Naish	Victoria University, Wellington	Antarctica history	
Jim Bowler	University of Melbourne	Geology	
Mike Sandiford	University of Melbourne	Tectonics, dynamics, envtl history	
Andrew Gleadow	University of Melbourne	Geochronology, continental history	
Ian Simmonds	University of Melbourne	Atmosphere-ice dynamics	
Kevin Walsh	University of Melbourne	Ocean-atmosphere dynamics	
Matt Cupper#	University of Melbourne	Palaeoecology, archaeology, geology	
Peter Kershaw	Monash University	Paleoecology	
John Magee	Australian National University	Geomorphology	
Meredith Orr	Monash University	Geomorphology, palaeohydrology	
Jon Woodhead	University of Melbourne	Geochronology	
John Hellstrom	University of Melbourne	Geochronology	
Roland Maas	University of Melbourne	Geochronology	
Brad Pillans	ANU	Palaeomagnetism	
John Chappell	ANU	Palaeoecology, geochronology	
Kurt Lambeck	ANU	System dynamics	
Mark Harrison	ANU	Tectonics & dynamics	
Paulo Vasconcelas	University Queensland	Geochronology	
Guy Holdgate	University of Melbourne	Palaeobotany	
Ian Cartright	Monash University	Isotopes	
Janet Hergt	University of Melbourne	Geological history	
Malcolm Wallace	University of Melbourne	Marine palaeo-environments	
Stephen Gallagher	University of Melbourne	Marine palaeo-environments	
Brian McGowran	University of Adelaide	Marine palaeo-environments	
Patrick Quilty	University of Tasmani	Antarctic history	
Patrick De Deckker	ANU	Antarctic history	
Will Howard	University of Tasmani	Antarctic history	
Brad Opdyke	ANU	Marine palaeo-environments	
Richard Wardle	Monash University	Modeling	
Amanda Lynch	Monash University	Modeling	
Giff Miller	ANU	Palaeo-environments, modeling	
Bill Budd	University of Tasmani	Antarctic history	
Peter Kershaw	Monash University	Palynology	
Kale Sniderman	Monash University	Palynology	
Sander van der Kaars	Monash University	Palynology	
Bob Hill	University of Adelaide	Palaeobotany	
Andrew Drinnan	University of Melbourne	Palaeobotany	
Pauline Ladiges	University of Melbourne	Palaeobotany	
Jane Hughes	Griffiths University	Riverine ecology	
Allan Chivas	Wollongong University		
Project 11		Role of Melanesia in the diversification of the Australian terrestrial biota	
Participant	Institution	Expertise	
Steve Donnellan (CI)	South Australian Museum	Vertebrate phylogeny and biogeography	
Arthur Georges (CI)	Univ. Canberra	Vertebrate phylogeny, biogeography, modelling	
Ken Aplin (CI)	CSIRO, Sustainable Ecosystems	Vertebrate phylogeny, biogeography, palaeontology	
Chris Austin	Charles Darwin University	Aquatic arthropods	
Mark Harvey	Western Australian Museum	Terrestrial invertebrates	
Scott Keogh	ANU, Botany & Zoology	Vertebrate phylogeny and biogeography	
Leo Joseph	CSIRO, Sustainable Ecosystems	Bird phylogeny and biogeography	
Jane Hughes	Griffith University	Aquatic inverts and fishes	
Luke Price#	Univ. Adelaide	Hylid frogs	
Erica Alacs#	Univ. Canberra	Chelid turtles	
Scott Hocknull #	Queensland Museum	Vertebrate palaeontology	
Mike Crisp	ANU, Botany & Zoology	Plant phylogenetics	
Jim Croft	CSIRO, National Herbarium	Botanist, biogeographer	
Dan Rabosky #	Cornell University	Diversification analysis and evolutionary ecology	
Andrew Hugall #	University Adelaide	Phylogeny & molecular clock analysis, molluscs	
Michael Heads	University of Goroka, PNG	Biogeographer	
Tim Charlton	Consultant – UK	Structural geologist	

Chris Pigram	Geoscience Australia	Structural geologist
Clive Burrett	University of Tasmania	Geologist
Tony Allan	CSIRO Petroleum Resources	Petroleum geologist, geochronology
June Hill	CSIRO Petroleum Resources	Petroleum geologist, geochronology
Hugh Davies	UPNG – Earth Sciences	Geologist
Simon Beams	Terra Search Pty Ltd	GIS and geodatabase of Melanesia
John Chappell	ANU, R.S. Earth Sciences,	Geomorphology, palaeo-climatology
Mike Macphail	ANU, R.S. Pacific and Asian Studies,	Palynology and palaeo-climatology
Project 12	Evolution of short-range endemic taxa associated with troglobitic and groundwater ecosystems	
Participant	Institution	Expertise
S.J. Appleyard	Groundwater Investigation Branch, Department of Water, WA	Hydrogeology
Andy Austin (CI)	University of Adelaide	Systematics and evolution of arthropods
A.J. Boulton	University of New England, Armidale	Ecology of freshwater systems
P. Clarke	South Australian Museum	Aboriginal anthropologist, ethnobotanist
Steve Cooper (CI)	South Australian Museum	Molecular systematics, evolution and phylogeography of arthropods
G. Fenwick	National Institute of Water & Atmospheric Research, Christchurch, N.Z.*	Systematics and ecology of subterranean Crustacea
Mark Harvey	Western Australian Museum	Systematics and evolution of short-range endemic arthropods
William Humphreys (CI)	Western Australian Museum	Ecology and systematics of stygofauna
W. Ponder	Australian Museum, Sydney	Systematics and biogeography of freshwater molluscs and mound springs biota
T. Finston#	University of Western Australia	Molecular systematics, evolution and phylogeography of stygofauna
Michelle Guzik#	University of Adelaide	Molecular evolution and phylogeography of stygofauna
P.J. Hancock#	University of New England, Armidale	Ecology of stygofauna
R. Leys#	South Australian Museum	Evolution of stygofauna
Nick. Murphy#	University of Adelaide	Molecular evolution of freshwater arthropods; mound springs
Project 13	Habitat reconstruction and restoration: securing biodiversity assets in the face of climate change	
Participant	Institution	Expertise
Bob Hill (CI)	University of Adelaide	Evolution of the Australia flora
David Paton (CI)	University of Adelaide	Conservation, ecology and restoration
Andrew Lowe (CI)	Dept for Environment and Heritage	Genetic structures of plant populations
Barry Brook	Charles Darwin University	Extinction ecology; population demography
Hugh Possingham	University of Queensland	Ecological modelling
Terry Root	Stanford University	Phenological responses of flora and fauna to climate change
Richard Hobbs	Murdoch University	Restoration ecologist
Ralph MacNally	Monash University	Ecological modelling, experimental design, terrestrial ecology
Andrew Bennett	Deakin University	Landscape ecology
David Freudenberger	CSIRO	Restoration ecology, revegetation
Jack Baker	NPWS New South Wales	Natural resource management
Robert Lambeck	Greening Australia WA	Revegetation programs
Patrick Smith	CSIRO WA	Conservation and restoration
Mark Lethbridge	Flinders University	Ecological modelling
Denis Saunders	CSIRO	Conservation biology
Nick Reid	University of New England	Integrating farm management and conservation

Early Career Researcher

Website Statistics – Attachment 3

Report generated from website: Page Hits by period 1-January-06 to 31-December-06

Page hits Chart	19260
welcome	5402
network members	3551
news	2062
projects	2025
System Feedback	1100
links	483
scope and audit	416
key features	403
System Message	328
postdoctoral researchers	284
evolution of the network	280
sponsors	265
About Us	232
post graduates	192
register interest	130
opportunities	129
organisational chart	112
Discussions	112
search	107
annual general meetings (AGMs)	96
research strengths	93
governance	81
About Us Intro	80
annual reports	76
contact us	76
Discussions	75
international trends	72
AboutUs	60
Project 1: Coping with change: resilience of marine social-ecological systems	56
2004 News	52
Results	49
Round 1_TDenham	45
Early Career Researchers	42
Coping with change: resilience of marine social-ecological systems	42
Planning	37
Planning	37
Project 2 Dr Tim Denham, Plant exploitation and domestication...	36
Project 2 - Plant exploitation and domestication east of the Wallace Line:	36
Results	35
Round 1_THughes	35
Working Groups	34
Project 2	31
2005 News	27

Project 1	25
Round 1_PGell	25
privacy	23
thankyou	22
2006 News	22
Round 1_Dan Faith	22
Introduction	21
Round1_PKershaw	18
Results	16
Project 4	15
Project 5 Planning	14
Project 3	14
Peter Gell, Recent Human...	12
Introduction	10
Project1_THughes	9