



CONSERVATION BIOLOGIST RETURNS

After 15 years away, alumnus Peter Banks returns to the School, with a large team of researchers, to take up the role of Associate Professor of Conservation Biology

Associate Professor Banks comes from the University of NSW where he has held an academic position in the School of Biological, Earth and Environmental Sciences for ten years.

As a behavioural ecologist who works on conservation, Prof Banks' research complements the School's strengths in a number of fields including invasive biology, sociobiology and urban ecology. "It is so exciting to be part of this department, which promises so many opportunities for new collaborations," says Prof Banks. "I also currently hold grants with a number of researchers here, so I look forward to expanding these interactions further."

Prof Banks is no stranger to the School, having completed an Honours degree and PhD under the supervision of Professor Chris Dickman. While his Honours research focused on population dynamics of small mammals, an accidental occurrence during his project set him on the path of studying invasive animals, which has continued throughout his career. "A fox was continually urinating on my traps, which was probably because I put my trap line in its territory," remembers Prof Banks. "From that experience in Honours, it was pretty easy to transition into my PhD looking at the impact of foxes on native and introduced mammals."

Following his PhD, Prof Banks worked with NSW National Parks on modeling fauna distributions to improve reserve

systems, which ultimately contributed to the creation of a new national park in the Hunter Valley. He then took up a postdoctoral role in Finland studying the impact of American mink on native mink and birds, and in 1999 was appointed by UNSW where he remained until the end of last year.

Broadly, Prof Banks' work uses behavioural ecology and an experimental approach to solve conservation problems. Currently, much of his work centres around introduced black rats and investigating various ways of mitigating their impact on native fauna. Since black rats pose problems by preying on eggs in native bird nests, Prof Banks and his students are devising ways of disrupting the chemical signals that rats use to find the nests as a mode of conserving the birds.

Around Sydney Harbour, Prof Banks is also working on a novel mode of controlling the black rat population that centres around an understanding of the animal's ecology. Together with research associate Dr Grainne Cleary, Prof Banks is removing black rats from the forests around Mosman and reintroducing native bush rats to take their place.

With a teaching-free year, Prof Banks will focus on his research, supervising a number of students both at Sydney and UNSW and furnishing his new lab space. His large team will also be busy settling into their new office – the Head of School's former rooms in the Science Road Cottage.

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FRIDAY 20 MAY 2011

KEAST LECTURE: DR DEVI STUART-FOX. 1PM-2PM DTA LT, A08

WEDNESDAY 10 AUGUST 2011

MURRAY LECTURE: PROFESSOR JIM HASELOFF. 5:45PM, EASTERN AVE AUDITORIUM

EDITORIAL

EDITOR: CARLA AVOLIO

ROOM 130,
MACLEAY BLDG,
THE UNIVERSITY OF
SYDNEY



HEADSPACE

Our academic year is in full swing and we are gearing up for an exciting calendar of events.

In February, even before the semester began, over 60 students spent a week at Mary River in the Northern Territory on our third year field-based unit Tropical Wildlife Biology and Management. This year, a cyclone passed directly over Mary River during the field trip and, while there was no damage from the cyclone itself, the site was isolated by floodwaters. Much to the delight of the students, they were airlifted by helicopter to the Humpty Doo pub from where they were transported to Darwin for their scheduled flights home. I expect some of the Biology Alumni of 2011 will be retelling this story for many years to come!

We have begun the process of connecting our alumni with current students to help them explore career options. This month, three of our biology alumni met with students at our careers event, Biology – A world of possibilities, to share their experiences and pathways into careers from medical research to mammalian conservation. Our aim is to run a similar session each semester and we are interested to hear from alumni who are willing to share their story with our up and coming biologists in this way.

I am delighted to welcome back one of our alumni, Assoc Prof Peter Banks, who has joined our academic staff this year from UNSW. Peter's group works on conservation biology, focused on the Sydney region. One of their projects involves the re-introduction of native bush rats into the reserves within Sydney – in fact they could well be coming to a reserve near you.... I wish Peter and his group every success in their new home at Sydney University.

This year's Keast Lecture will be delivered by Dr Devi Stuart-Fox from the University of Melbourne. Dr Stuart-Fox is an evolutionary and behavioural ecologist who will present her work at a public talk on 20 May, 1pm – 2pm, in the Heydon-Laurence Building. Everyone is welcome to attend. In place of our annual Alumni cocktail party, this year we are planning an open day at Warrah, our field station at Pearl Beach. Please watch future newsletters for details.

With warm regards,

A handwritten signature in black ink, appearing to read 'Robyn Overall'. The signature is fluid and cursive.

Robyn Overall

RESEARCH SPOTLIGHT: DR GLENDA WARDLE

Dr Glenda Wardle believes that an understanding of populations is core to ecology and will be essential for us to predict and successfully manage change in the world's ecosystems in the future.



“Studying populations of species – their size, life history traits and extinction – is important because it cuts across many scales,” says Glenda. “Everything, from understanding evolutionary processes of hybridization to managing the risk of invasive pines, comes through the filter of populations.”

Glenda and her team study the ecological and evolutionary processes that shape the spatial and temporal patterns of variation found in populations. Their work combines mathematical modeling with empirical data from greenhouse experiments and fieldwork, which takes them everywhere from the Sydney region to the Simpson Desert.

In recent years, Dr Wardle's research on populations has led to conceptual advances in the fields of invasive biology and plant demography. For example, work published this year in *Ecology Letters* saw Glenda and colleagues develop a new Synthetic Invasion meta-framework that extracts the essential elements of how invasive populations change over time and spread through the landscape. “Despite an exponential increase in the number of studies on invasion biology, we lack generality in the causal explanations for invasions,” says Glenda. “A conceptual framework will be useful to focus our attention on the key ecological and evolutionary processes that we know operate, so we can distill a general understanding about the many and overlapping mechanisms that potentially cause invasions.”

Glenda's research on populations is also contributing to practical restoration of fragile systems. PhD student Alison Frith, and collaborators from Mt Annan Botanic Gardens, are working on restoration of the grass species in the threatened Cumberland Plain Woodlands, in particular on how to provide sufficient high quality seed to resource the restoration industry. “Alison is using a population approach to compare the performance of grass seeds from remnant populations to bulk production of seeds from dedicated seed production areas,” explains Glenda.

Over the last few years, Glenda has also turned her attention to address how ecosystems will respond to climate change. In addressing this complex question, PhD student Nathan Emery is using species of flannel flower, *Actinotus*, to determine the adaptive capacity and resilience of populations to changed environments. Undertaking manipulative experiments, combined with ecological field studies, Nathan will develop models to more accurately predict how the distribution of *Actinotus* might alter under future climate change.

Last year, Glenda commenced an ARC grant with Professor Chris Dickman to study how species interactions will adjust to increased climatic extremes, using the Simpson Desert as a model system. “Extreme weather events are expected to become more frequent and more intense in the near future,” says Glenda. “The climatically unpredictable environment of the Simpson Desert is the best place to study how ecological

systems respond to extreme events, and provide the first insights into the mechanisms that drive change.”

Disentangling the factors that drive these changes through large-scale manipulations has become routine for this group. Anke Frank completed her work last year on the effects of grazing on the flora and fauna and two other PhD students are in the final stages. Tim Parratt built rain shelters and conducted fire and watering experiments to understand the patterns of seed germination and vegetation change and Max Tischler has discovered how the birds respond to the resource pulses in woodlands and grasslands across multiple spatial scales.

Life and research in the desert continues: PhD student Tony Popic is investigating the interactions between flowering plants and their pollinators and how those interactions affect the structure and function of the ecological communities. Fortunately for Tony, the Simpson Desert has been experiencing one of the wettest periods ever recorded, with lush green blanketing the red sand dunes. “All the rain has brought an explosion of flowers and insects to the desert,” says Glenda. “So while flooding has prevented us from travelling to the desert on some occasions, the boom has also led Tony to discover 27 new species among the 100 bee species recorded in the desert so far”. This illustrates that the life of an ecologist can take you to interesting places, personally and professionally.”

WHO'S NEW?

BANKS LAB – BEHAVIOURAL ECOLOGY AND CONSERVATION RESEARCH



JENNA BYTHEWAY,
RESEARCH
ASSISTANT



CATHERINE PRICE,
PHD STUDENT



ALEX CARTHEY,
PHD STUDENT



CARAGH
THRELFALL, PHD
STUDENT



DR. GRÁINNE CLEARY,
RESEARCH ASSOCIATE



NICOLE HANSEN,
MASTERS
STUDENT



WENDY GLEEN,
MASTERS



MALITH
WEERAKOON,
MASTERS

VIYANNA LEO,
NEW PHD
STUDENT



HELEN SMITH,
NEW PHD
STUDENT



ROSANNA SCARAVILLI

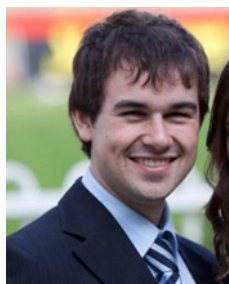


Rosie has taken up the position of Executive Assistant to the Head of School. She will be replacing Susan Thomas in this role and will also be looking after the Human

Resources Administration for the School. Rosie has a background in HR where she worked previously for Human Resources at the University.

When not at work, Rosie enjoys travelling, learning about different cultures, yoga and especially cooking.

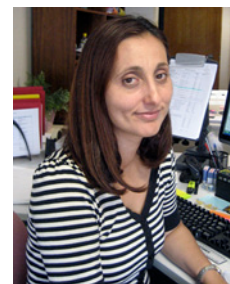
CHRIS O'NEIL



Chris started as Student Services Assistant in early 2011. In this newly formed position, Chris is the first point of contact for all students in Biological Sciences. Chris holds a Bachelor

of Arts from Macquarie University, a Bachelor of Teaching (Secondary Education) from UTS and is studying for his Master of Arts part time at the University of Sydney. Prior to working at Sydney, Chris was employed as an Academic Officer for Curtin University. In his spare time Chris likes snowboarding.

NIKI FLAME



Niki has taken up the new position of Manager of School Administration in the School to provide strategic advice to the Head and oversee all administrative

functions. She brings new insights to the School, particularly in the area of student services where she has experience in the Faculties of Architecture and Law.

After schooling at Fort St High, Niki completed a degree in Finance and Business at UTS.



Professor Marie Bashir, AC CVO Governor of NSW and Patron of the Royal Society of NSW, presented the prize to Professor Shine at the Royal Society's Annual Dinner held on 18 February in the University of Sydney's St Paul's College. Image credit: Don Hector

NSW ROYAL SOCIETY HONOUR

Professor Rick Shine has been awarded the Walter Burfitt Prize by the Royal Society of NSW for conducting research in the last six years "of the highest scientific merit".

A world leader in the ecology and evolution of frogs and reptiles, Professor Shine's work in recent years has focused on the biology, impact and control of the cane toad in Australia. In particular, his work explores the way in which ecological research can be used to develop innovative approaches to conservation challenges, especially those faced by native predators affected by cane toads.

Work by Professor Shine and colleagues has shown that native fauna can be taught to avoid eating cane toads through "conditioned taste aversion", native meat ants can be employed to control cane toads at the juvenile stage and the cane toad's own alarm pheromone can be used to stunt the growth of larval toads.

CLAUDIO MUHLRAD WINS GENERAL STAFF AWARD

Claudio is the first person ever to be awarded this prize, which was created in 2010 by the Faculty of Science to recognize excellence in professional staff.

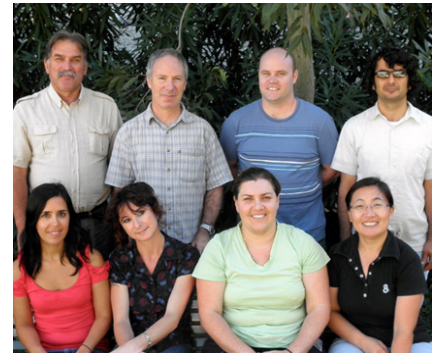
The Dean of Science, Professor Trevor Hambley, said: "Mr Muhlrad has made an outstanding contribution to the School and the Faculty through his excellent management of practical laboratory classes for over 2500 first year undergraduate students, his insistence on quality improvement in infrastructure, his sound team management and his striving to continually improve the student experience."

Claudio has been a member of the School for 22 years and has worked for the duration in providing teaching support for first year classes. Starting out as a laboratory assistant in

1989, today Claudio manages a team of seven technical officers who are responsible for numerous undergraduate courses.

Although the university teaching system has changed greatly in two decades – first year biology class sizes increasing from 1000 to 2500 students, for example – Claudio's passion for quality education remains unchanged and continues to fuel his pursuit for excellence.

Head of School, Professor Robyn Overall, said: "Claudio has done an exceptional job of engendering a supportive environment for his team members. He has developed a co-



operative positive culture, empowering them to take responsibility for their own work areas."

Claudio agrees that of all he has accomplished in 22 years, he is most proud of his team. "I am so lucky to have a team who are dedicated to making sure the laboratories are 100% and the students get the best practical experience possible. Their cooperation is also tremendous. If somebody needs a hand with a unit of study, my team will band together and help. Although my name is on this award, it was won by the hard work and commitment of my team members. I am so proud they are being recognised for it."

VIRUS EXPERT TO JOIN SCHOOL IN 2012

Professor Edward Holmes, an internationally renowned infectious diseases expert, has won a five-year, \$4 million National Health and Medical Research Council Australia Fellowship to conduct research jointly at the School of Biological Sciences and Sydney Institute for Emerging and Infectious Diseases.

As part of the NHMRC Fellowship, due to commence in 2012, Professor Holmes will develop The Australian Disease Database, which will help accurately predict how diseases like swine flu and bird flu might arrive in Australia and spread.

His project will combine information from a growing database of virus genome sequences, with socio-economic and geographical information about Australia, including population densities, domestic and international flight traffic, major road networks, work patterns, and major landscape features such as the Great Dividing Range.



TOP MARKS TO AMPHIBIAN INVASION STUDY

Reid Tingley has won the Postgraduate Excellence Prize in Biological Sciences for his PhD research.

Reid was one of four PhD students – including James Herbert-Read, Bridget Murphy and Endymion Cooper – to reach the finals for the 2010 prize, which judges said was particularly hard to award due to the exceptional quality of all candidates and the “razor thin” difference between them.

“Winning this prize is an honour,” said Reid, who competed with finalists for the \$1000 prize by presenting a 20-minute seminar to the School, which was judged by a panel of academic staff. “I am particularly grateful to the members of my lab, who have provided so much support throughout my PhD.”

Originally from eastern Canada, Reid came to Australia in 2009 to join Professor Rick Shine's cane toad-focused research group – Team Bufo – and commence a PhD studying the invasion dynamics of amphibian species across the globe. In only two years, Reid has uncovered fascinating patterns regarding amphibian invasions – both in Australia and globally – which have provided important information for predicting the rate of spread of cane toads into inland regions of Australia, and given evolutionary insights into why amphibian invasions have been so successful in certain places.

Following a two-month survey of cane toads, conducted last year in western Queensland, Reid was able to show that toads are moving as quickly through arid areas as tropical



regions. “Although the dry interior of Australia has long been considered inhospitable to these tropical toads, my research has shown that in wet years, toads will be able to disperse rapidly into the arid zone, where they may remain permanently established around artificial water bodies such as dams,” said Reid, who attached radio tracking belts to toads to study their movements.

While closely monitoring the spread of cane toads in semi-arid Australia, Reid has also been studying the invasion patterns of other amphibian species around the world. After comparing data on successful and unsuccessful amphibian introductions across the globe, Reid has found, surprisingly, that introduced frogs, toads, and salamanders are more likely to successfully invade places where there are closely-related species living. This result challenges ideas put forward by Charles Darwin, who reasoned that invaders would fail in a new area if they had to compete with similar species that were already well adapted to the new conditions. Reid suggests that “closely-related species share numerous traits, so invaders that are closely related to species that are already doing well in the new environment are likely to flourish as well.”

In recognition of his PhD research, Reid will officially receive his prize at the School of Biological Sciences' annual prizes and scholarships ceremony on May 13.

ALUMNI PROFILE: DAVID SALT

Over two decades ago, David Salt (BSc (Hons) '83) left his career in research to pursue science writing and has never looked back. Five years ago, he co-authored a pioneering book, *Resilience Thinking*, which offered a new way of understanding our complex world and how to manage its resources. Now writing its sequel, we hear about David's next step in turning people onto the new paradigm of resilience thinking.



Three years after graduating from an Honours degree in marine ecology, David Salt decided that he wanted to pursue a career in science communication. So he created a classroom activity on intertidal marine ecology, packed his bags and took the workshop to over 50 schools between Sydney and Perth. 25 years later, David has become one of Australia's most respected science writers – producing the nationally acclaimed publications *The Helix*, *Newton* and *Materials Monthly*, for which he was awarded a Eureka Prize.

One of the most challenging outputs of his career has been *Resilience Thinking*, a book written in 2006 with Brian Walker that introduced the emerging paradigm of 'resilience thinking' and how it could be used to manage the environment in a new way. We caught up with David to hear about his current role, how his book is being received five years on and why the environment is right for a sequel.

What is 'resilience thinking'?

Ecological resilience is the capacity of a system to absorb disturbance and still retain its basic function and structure. Resilience is an emergent property of a complex system.

Resilience thinking is a set of ideas to

help us engage with the complexity of the natural systems that we depend upon. These ideas provide us with insights on how natural systems change over time, why they are resilient or lack resilience, and what are the important things we should consider in our management of them.

Why is it important?

Increasingly, cracks are appearing in the capacity of our communities, ecosystems and landscapes to provide us with the goods and services that sustain our wellbeing. Our resource base, planet Earth, is shrinking while our population continues to expand. The response from most quarters has been for 'more of the same' that has got us into this situation in the first place: more control, more intensification and greater efficiency.

Resilience thinking offers a different way of understanding the world around us and of managing our natural resources. It explains why greater efficiency by itself cannot resolve our resource issues, and it offers a constructive alternative that opens up options rather than closing them down.

Has Australia adopted this new way of thinking?

The word 'resilience' has become a bit of a buzz word over recent years. You'll see it (and the word 'resilient')

in all forms of vision and mission statements in both the business and government sector. For many it's a new buzz word replacing the old buzz word 'sustainable'. Most people, however, still only have a hazy idea what it's all about. And, it has to be said, ecological resilience is just one definition of resilience. Engineers, psychologists, disaster workers all have their own take on the concept.

And the science behind ecological resilience is not that new - it's been in continual development over the last three decades. However, resilience thinking is new to the way we manage our natural resources. Australia has made major contributions to the development of resilience science over the years and many Australian governments are now attempting to integrate resilience thinking into policy development and management. It's early days at the moment.

What is the sequel?

The book *Resilience Thinking* came out in 2006 and was very well received. It has been a bit of a touchstone for people who have been questioning the wisdom of economic optimisation and efficiency as solving all our problems.

But the question quickly arose, what's next after the thinking? This led to Brian and I to begin writing a sequel

ALUMNI PROFILE: DAVID SALT CONT.

called *Resilience Practice* which is all about putting the thinking to work. The first draft is almost finished so we hope it might be out in the next year.

What is your current role?

I'm based at the Australian National University where I work as a writer and editor for the ARC Centre of Excellence for Environmental Decisions (CEED). I produce a monthly magazine called *Decision Point*, which is all about research on environmental decision science. This is the science behind the planning of networks of nature reserves, adaptive management and making decisions under different amounts of uncertainty. *Decision Point* aims to connect the science to policy people and decision makers. It's being going for four years now and is growing quite a following.

What has been the highlight of your career?

My career highlights are *The Helix*, *Materials Monthly* and *Decision Point*. These are three monthly science publications that I nurtured from small beginnings into important and influential magazines. And, of course, *Resilience Thinking* has also been something of enormous importance to me. Writing it changed the way I looked at the world; and I think it's had an impact on many of its readers. That's the most you can hope for in anything you write.



ALUMNI SHOW STUDENTS A WORLD OF POSSIBILITIES

On April 12, three alumni returned to the University to present a careers event highlighting the exciting future awaiting biology graduates.

Hosted by the School, the successful event featured talks by alumni Dr Dan Lunney, Dr Laurence Cantrill and Kirstin Proft, on how to build a career after university, followed by a networking session where the students and alumni chatted one-on-one. The School would like to thank our alumni, and Dr Mathew Crowther, for donating their time and expertise to our students. We plan to run this career event every semester and look forward to hosting more of our alumni later in the year.

Biology alumni presented an inspirational careers event – Biology, a world of possibilities – to University students on April 12. Clockwise from top left: Head of School, Robyn Overall; Mathew Crowther; Kirstin Proft; Laurence Cantrill.

FACULTY OF
SCIENCE



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