1 Research Reports – 2005

Saving Wildlife- Saving People on Our Roads

Investigators: Enhua Lee, David Croft and Daniel Ramp
School of Biological, Earth & Environmental Sciences, UNSW Sydney 2052

The ecological effects of roads on landscapes and their ecological processes are substantial and together represent a major anthropogenic disruption to the natural environment. Current understanding of the impacts of roads for their strategic management is hampered by a lack of information on the influence of the ecosystems traversed by roads on road effects, the effects of roads on higher-order ecosystem responses (populations and communities), and the overall impacts of roads on ecosystems and their wildlife (integrating both abiotic and biotic components of ecosystems).

This study used the Silver City Highway in arid New South Wales as a model for a typical road in an arid ecosystem to investigate the ecological effects of arid-zone roads and their management. The study examined the spatial distribution of soil, vegetation and vertebrate (kangaroos, small mammals, and lizards) variables in relation to the road, explored the factors contributing to these respective spatial distributions, investigated the effects of arid-zone road management on vegetation, assessed the barrier effects of an arid-zone road on small mammals and lizards, and determined the patterns, causes and effects of kangaroo-vehicle collisions.

The study revealed that the arid-zone road influenced the spatial distribution of most of the variables measured, skewed the population demographics of two kangaroo species, and altered the community composition of small mammals along its edge, with two small mammal species listed as threatened in New South Wales (*Sminthopsis macroura* and *Leggadina forresti*) negatively impacted by the road. Increases in the amount of water along the road edge drove many of the subsequent effects of the arid-zone road as arid-zone flora and fauna are adapted to exploiting limited and patchily distributed resources. However, current arid-zone road management also influenced vegetation quality, microclimates around the road influenced kangaroo distributions, and kangaroo flight behaviour and temporal variations in traffic volume affected roadkill frequency.

Together, these results suggest that roads have a high overall ecological impact in arid ecosystems. Conservation managers need to first rank the impacts of arid-zone roads in order of their conservation importance and need for mitigation, and from there, devise relevant informed management frameworks to target these impacts.

Publications:

Ramp, D. (2005). A new frontier: The road environment and its impact on kangaroos. In, *Kangaroos: Myths and Realities*, eds. M. Wilson & D.B. Croft, pp. 155-167. (Australian Wildlife Protection Council, Melbourne).

Klöcker, U., Croft, D.B. and Ramp, D. (2006). Frequency and causes of kangaroo-vehicle collisions on an Australian outback highway. *Wildlife Research* **33**: 1-11.

Using olfactory stimuli to reduce animal-vehicle collisions: Aversive properties of the dingo bush (Eremophila microtheca) for macropods

Investigators: Konstanze Gebauer[1], David Croft[2] and Dan Ramp[2]
[1]University of Potsdam, Germany
[2]School of Biological, Earth and Environmental Sciences
UNSW Sydney NSW 2052

With more and more traffic access-ways and vehicles using them, the problem of animal-vehicle collisions is increasing in all parts of the world. Besides large economic losses from vehicle damage and human injuries the loss of biodiversity is a problem of growing concern. Different ways to mitigate road-kills are used but not all effectively reduce animal-vehicle collisions. A widely discussed possibility to increase the visibility of animals next to roads for drivers and to reduce the attractiveness of road-sides verges to animals is to modify these road-side verges.

This study investigates the aversive properties of a native shrub, Dingo Bush (*Eremophila microtheca),* to deter macropods from road-side verges in road-kill hotspots. The leaves of this plant emit a distinct smell of dog fur. Since Dingos, wild dogs and introduced Red foxes represent the main non-human predators for macropods, the aim of this research is to trigger the anti-predator response to avoid places with heightened predatory risk.

Field experiments were conducted at the Fowlers Gap Research Station and Sturt National Park, New South Wales (Australia), to test the repellence of Dingo Bush to macropods at food or water sources in natural conditions. Red kangaroos and Grey kangaroos showed only slight aversive responses to Dingo Bush.

Pen trials at the Cowan Field Station, New South Wales were used to gain more precise data on three different macropod species, Red kangaroos, Eastern Grey kangaroos and Swamp wallabies. While Swamp wallabies showed no aversive response, Red kangaroos reduced feeding from boxes surrounded by Dingo Bush for 4 days and Grey kangaroos for one day.

Behaviour and ecology of the zebra finch

Investigators: Simon Griffith
School of Biological, Earth and Environmental Sciences
UNSW Sydney NSW 2052

Following our preliminary work in spring 2004 on natural nesting zebra finches this year we concentrated our efforts on establishing a study population that bred in artificial nesting boxes, inspired by European studies of hole nesting species such as the blue tit, great tit and pied and collared flycatcher. By providing artificial nest boxes for the birds we make it far easier to conduct research on them for a number of reasons. Most importantly, the nests are easier to locate and monitor, and the boxes protect the nests against many forms of predation. Last year over 90% of the natural nests we found were subsequently predated, by contrast, nests in nest boxes this year were mostly successful and less than 10% suffered predation. Our main focus this year was to establish a number of different nest box areas and sample a large number of families for conducting a population wide survey of extra-pair paternity. To this end we erected 400 nest boxes and managed to capture both parents and get blood samples off all the offspring for around 150 families. The nest boxes were erected in four areas, Saloon, West Mandelman, East Mandelman and Gap Hills and there were some interesting differences between the areas in terms of nesting success, time of breeding and overall numbers of birds using the areas, all of which are going to be the focus of more continuous ongoing work.

In addition, we tested some new techniques for recording parental care at the nest, based on transponder tags that allow us to log every visit made by a tagged adult over the whole nesting cycle, providing unprecedented levels of data with which we can explore parental care in a number of experiments (to be conducted in 2006). Finally, we measured the variation in colour in a large sample of wild birds (using optical spectrometry), and sampled sperm as part of our study into the effects of the domestication process on zebra finches. The sperm were sampled in collaboration with Prof. Tim Birkhead's group in Sheffield (UK) and are part of his long-term interests in the evolution of sperm competition in birds.

Mate choice in the zebra finch: has domestication affected sexual preference?

Investigators: James Brazill-Boast and Simon Griffith
School of Biological, Earth and Environmental Sciences
UNSW Sydney NSW 2052

Zebra finches have been the subject of numerous laboratory-based experiments investigating mate choice and other aspects of sexual selection. Nearly all of this work has focused on individuals kept in captivity for tens or hundreds of generations. Here we investigated whether differences in sexual behaviour and morphology have arisen between wild birds and domestic stocks. Using a population of adult birds taken from the wild in the arid zone of Australia, and domestic birds from Sydney, we tested female mating preferences and sexual responsiveness in a) conventional mate-choice chamber trials, and b) mixed interactive groups in flight aviaries permitting the analysis of inter- and intrasexual behaviours in a social environment. Although the domestic birds were all 'wild-type' individuals there were significant differences in a range of morphological and behavioural traits, including beak colour (a sexually selected trait). In both the mate-choice chamber and the socially interactive trials females preferred males from the same origin as themselves, i.e. wild preferred wild, domestic preferred domestic. Given the divergence in morphology between individuals from different origins this meant that the two sets of females had opposing preference functions; domestic females preferred larger and redder individuals whereas wild females preferred the opposite. These findings of divergence in morphological traits and sexual behaviour between wild and domestic zebra finches have wide implications for the interpretation of experiments based solely on domestic populations.

Behaviour and ecology of the cooperatively breeding chestnut-crowned babbler

Investigators: Andrew F. Russell[1]& Simon Griffith[2]
[1]Department of Plant & Animal Sciences, University of Sheffield, Sheffield S10 2TN UK
[2]School of Biological, Earth and Environmental Sciences
UNSW Sydney NSW 2052

Chestnut-crowned babblers are an endemic cooperatively breeding bird species of arid regions of eastern Australia. In 2004 a field site was set up at Fowlers Gap to study the behaviour and ecology of this previously unstudied species. In that year, we found that babblers prefer to forage in drainage lines where food availability and levels of cover are higher, and that they prefer to nest in large casuarinas along creek beds. This year, we extended the field site to include 55 breeding groups in a 50km^2 region around the homestead of the station. A total of 500 birds have now been banded with unique colour-ring combinations, with each also being measured and a small blood sample taken for genetic analysis. This year, we have found that at Fowlers Gap chestnut-crowned babblers live during periods of non-breeding (January-July) in groups of up to 30 individuals (mean = 19). Before breeding in August, groups break up into 1-3 breeding groups of 2 to 15 individuals each (mean = 7). Groups comprise adults and offspring from the previous year, as well as a number of immigrants from other groups. Clutch sizes vary from 2 to 6, but hatching success is surprisingly low; commonly one or two eggs fail to hatch. Both the incubation and chick-rearing periods last for around 3-4 weeks each. Eggs are incubated by the mother only, but chicks are fed by all group members until their independence at least one month after fledging. Helpers do not appear to influence chick survival which is high, but influence the number of breeding attempts made in a season by the dominant female. Small groups only ever have one successful breeding event rearing around 4 chicks, while larger groups may have up to three successful breeding events, rearing as many as 12 chicks. Finally, despite the large and strong nature of babbler nests, some nest-predation occurs. At present, we can only speculate as

to the culprits of nest predation, but three distinctly different types occur. The two most common types involve no damage to the nest (suggesting snakes or butcher bird) or a large hole being made in the side of the nest (suggesting monitor lizard). The other, rarer, type involves the entire top of the nest being ripped off, possibly suggesting a large raptor. The aim in 2006 will be to carry out further observations on this fascinating species and to publish our first paper on the ranging behaviour of chestnut-crowned babblers at Fowlers Gap (Portelli *et al*. in prep.).

The socioecology of the cooperatively breeding Chestnut-crowned Babbler (Pomatostomus ruficeps)

Investigators: Dean Portelli[1], Simon Griffith[1] & Andrew F. Russell[2]
[1]School of Biological, Earth and Environmental Sciences
UNSW Sydney NSW 2052
[2]Department of Plant & Animal Sciences, University of Sheffield,
Sheffield S10 2TN UK

Avian cooperative breeding systems have long intrigued behavioural ecologists, primarily because of the seemingly maladaptive behaviour of individuals foregoing independent reproduction to help raise the offspring of others. The primary focus of this research has been on the evolution of cooperative breeding systems, concentrating on the differences between cooperative and non-cooperative species. However, there is considerable diversity in social organisation among cooperative breeding birds, which has largely been ignored. Investigating the factors promoting this variation offers great potential to increase our understanding of the evolution of cooperative breeding systems. The aim of the present study was to examine the relationship between the ecology and social organisation of the cooperatively-breeding Chestnut-crowned Babbler *(Pomatostomus ruficeps)* in the context of the socioecology of its congeners, all of which also breed cooperatively. The foraging ecology, group size, home range size and nest-site selection of a population of Chestnut-crowned Babblers in arid far-western New South Wales were examined using focal sampling of groups and a novel method developed for estimating home range size using a geographic information system. All *Pomatostomus* babblers live in breeding units of similar size; however, the Chestnut-crowned Babbler differs conspicuously from its congeners in two aspects: (1) the home ranges of this species are considerably larger, and (2) social interaction between breeding units is more developed with distinct social groups forming early in the breeding season. I argue that habitat characteristics of the Chestnut-crowned Babbler, namely increased predation risk and low productivity of food resources, promote this increased social interaction through the benefits associated with foraging in larger groups. Future comparative studies of the socioecology of closely-allied species across a diversity of avian taxa will greatly enhance our understanding of the role of ecology in the evolution of cooperative breeding systems.

Behaviour and ecology of the cooperatively breeding Apostlebird

Investigators: Jonathan Wright, Anahita Kazem and Nina Figenschau
Institute of Biology, NTNU, Trondheim, 7491 Norway.
Andrew Russell, Michael Griesser and Jonathan Barnaby
Department of Animal & Plant Sciences, University of Sheffield, S10 2TN, U.K.
Simon Griffith
School of BEES, UNSW, Sydney 2052, Australia.

Our aim was to set-up a long-term future study population of apostlebird (*Struthidea cinerea*) groups around Fowlers Gap. Ultimately, we want to be able to carry out detailed behavioural observations and experiments on various topics, such as foraging, vigilance, mobbing, vocalizations, allo-preening, allo-feeding and helping at the nest. We therefore started off by

catching, individually colour-banding and bleeding (for genetic analyses of relatedness) as many birds as possible. We have then been habituating groups to the presence of human observers. As part of this we have been feeding the birds small pieces of bread from the hand with the aim of getting them to regularly stand on electronic balances to assess individual changes in body mass. This year we have also quantified nest site choice, vegetation mapped foraging areas, and collected information on group home ranges during the summer and the winter. The population of apostlebird groups at Fowlers Gap appears to be surprisingly fluid, as compared with populations further east in Australia. Birds often moved between breeding groups, with most groups splitting prior to breeding and then reforming into larger and more mobile groups during the winter. There are some interesting implications here for variable patterns of relatedness within and between groups, which will form the basis of future study on this population.

Solar photovoltaic pumping

Investigators: Shelley Bambrook and Richard Corkish
School of Photovoltaic and Renewable Energy Engineering, UNSW, Sydney 2052, Australia.

During 2005, Shelley Bambrook, a student of Photovoltaics and Solar Energy Engineering at the UNSW Centre for Photovoltaic Engineering, supervised by Dr Richard Corkish, carried out her final year thesis project at Fowlers Gap. Shelley worked on two aspects of solar photovoltaic water pumping.

Fig. 1. Shelley Bambrook and David Croft diagnose the Freislich Dam solar powered pumping system.

She first diagnosed then repaired several problems at the existing photovoltaic pump for the homestead water supply from Freislich Dam. She found that an open circuit of a quarter of the photovoltaic array had resulted from a failed junction box and that some shading had been introduced by the installation of some star pickets and by sapling growth. Some rapid repairs and

Shelley soon had the pumping power of the system restored and the water supply of the homestead complex restored.

Shelley then designed and installed a solar pump to operate in parallel with the wind pump that lifted water from Warren's Tank to a concrete tank for distribution to stock watering troughs. This project was motivated by the unreliability and the maintenance costs for the wind pump.

Fig. 2. Shelley Bambrook posing with the solar modules and floating pump at Warrens Tank.

Rainfall intensity and storm properties at Fowlers Gap, 2000-2006

Investigators: David Dunkerley
School of Geography and Environmental Science
Monash University Victoria 3800

For many applications in hydrology, ecology, and geomorphology, relatively high-resolution rainfall records are required. For example, the above-ground parts of dryland shrubs with dense foliage, such as many bluebushes, partially prevent rain that arrives in small amounts from reaching the ground beneath the plant canopy. Instead, much of the rain is detained and simply wets the foliage. This water returns to the atmosphere as the foliage dries, resulting in a reduced amount of soil water recharge. In larger (longer and/or more intense) storms, much of the rain may drip from the wet canopy and so reach the ground. Clearly, therefore, storm intensity and duration are important to plant water supply, not just daily or annual total rainfalls. The timing of rain during the day is also important to the potential for loss by canopy interception (Zeng et al. 2000): rain falling during a warm afternoon may be evaporated from wet foliage faster than would occur during early morning rain.

Understanding interception and some other aspects of dryland hydrology thus requires data on rainfall intensity hour-by-hour or even minute-by-minute. Another example is provided in the understanding of surface runoff. This can occur quite quickly if the rainfall intensity exceeds the infiltration capacity of the soils, or only after a longer wetting-up time in less intense rain, which slowly saturates the soil (Bidin & Chappell 2006). Daily rainfall totals may conceal shorter bursts of high intensity.

Two recording rain gauges have been maintained at Fowlers Gap since 2002. These record the arrival time of each 0.5 mm of rainfall. This report presents preliminary results from the analysis of the rainfall records.

Figure 1 shows the amounts of rain recorded in the period September 2002 – March 2006 for each hour of the day at one gauge. It can be seen that the least rain fell in the early hours of the morning, with an uneven rise to a peak between 6 and 7 pm. This pattern is commonly seen in dryland rainfall records, and is taken to reflect the role of warm soil in causing upward convection of air in the late afternoon. (Pooled data like this may conceal seasonal differences, which have not yet been analysed).

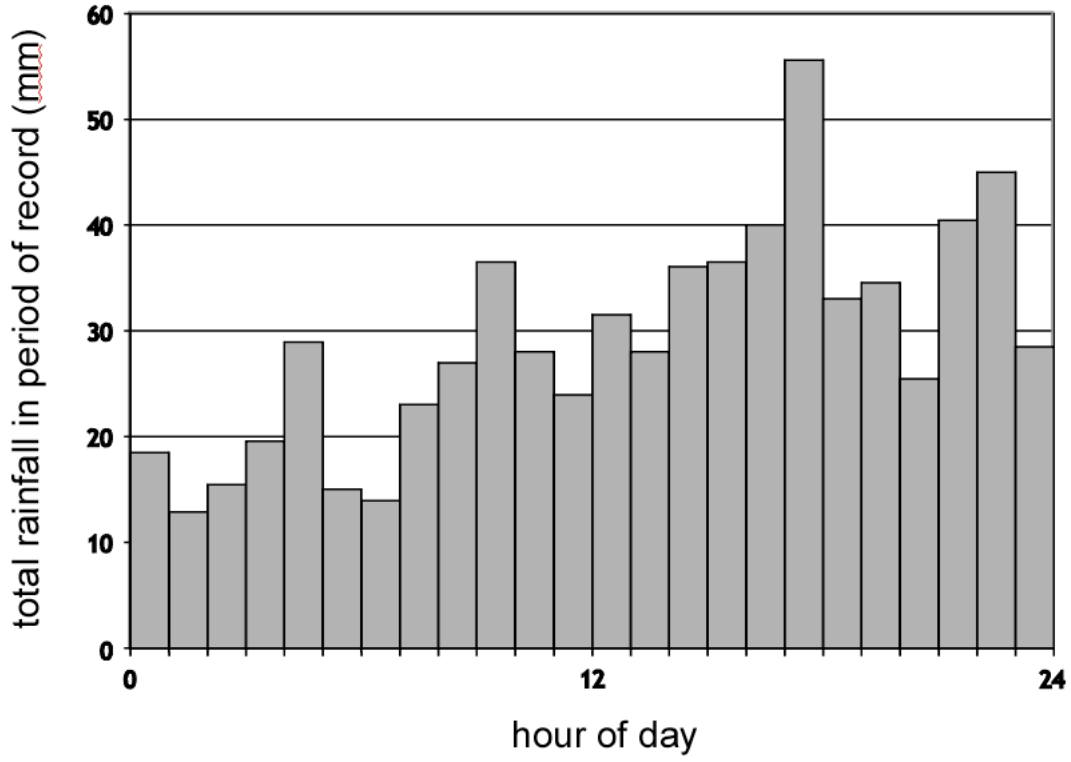


Fig 1. Distribution of rainfall at Fowlers Gap by hour of day

As noted above, the behaviour of rainfall intensity is important to many landscape and ecosystem processes. The gauge records have been analysed to determine the highest rainfall occurring in periods of differing duration: 1,2,5,10,15,20,30,40, and 50 minutes, and 1,3,6,12 and 24 hours, using all available data. These intensities are expressed as the equivalent rainfall intensity in mm/hour.

Figure 2 shows the relationship between maximum intensity corresponding to any of the time intervals listed above. Many soils around Fowlers Gap are able to absorb rain at a rate of about 10 – 15 mm/h (Dunkerley 2000). According to Figure 2, rain at Fowlers Gap may average this intensity for periods as long as 2 hours, and widespread surface runoff would be expected under these conditions. But Figure 2 shows that over shorter periods, far more intense bursts of rain are received. For example, in a 10-minute period, rain falling at a rate equivalent to 66

mm/hour was received, while in a 5-minute period, the maximum intensity was equivalent to more than 100 mm/hour. These short but intense bursts may contribute to the scouring of soil surfaces and may trigger the motion of larger soil particles. Interestingly, the 5-minute intensity at Fowlers Gap (102 mm/h) exceeds that recorded in Borneo (74 mm/h) by Bidin & Chappell (2006).

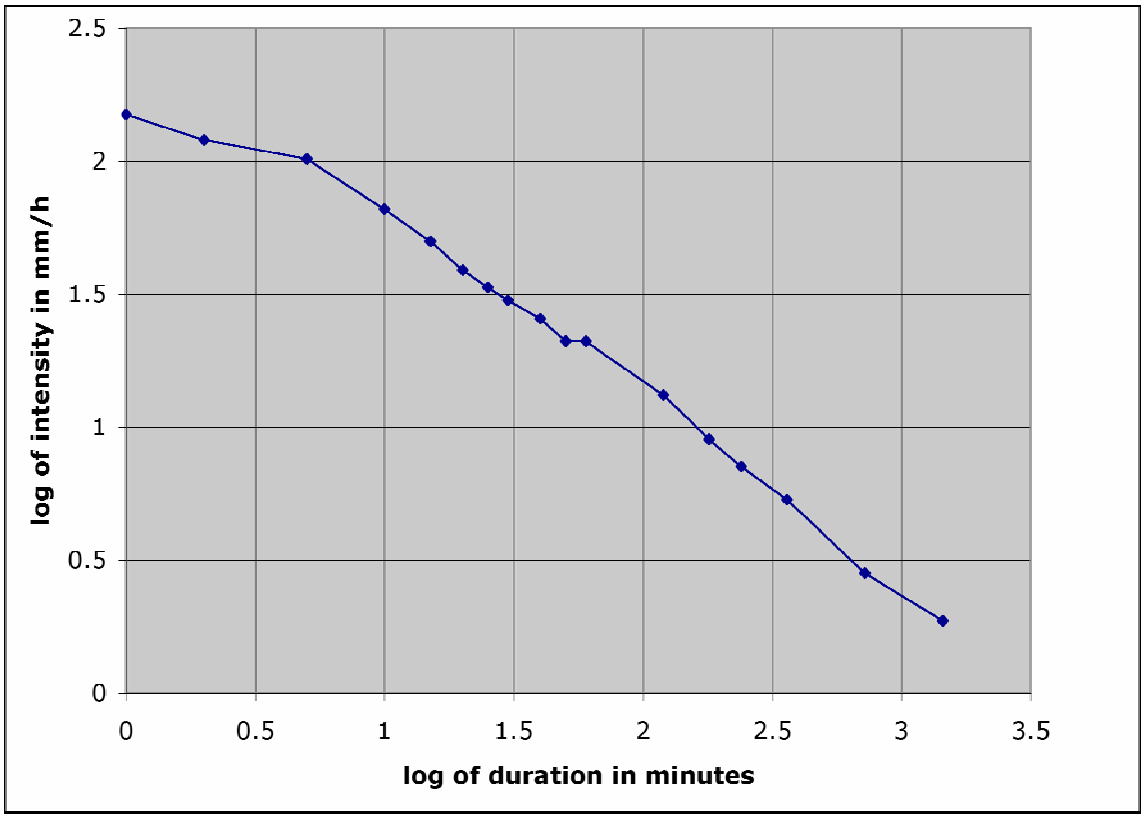


Fig 2. Relationship between rainfall intensity and measurement interval

In the raingauge records available so far, the highest one-day rainfall was 29 mm. This yields an average intensity through the day of 1.21 mm/h. However, the highest 24-hour intensity was a little greater (1.875 mm/hour). This 24-hour period ran from just before 2 pm on a February day in 2003 until the following afternoon.

Rain events (commonly called 'storms') can be defined in various ways, but often they are delimited by adjacent rainless periods of 2 – 12 hours. Thus, a single day may contain more than one storm, or a single storm might last more than one day. Storm duration in an ecologically important parameter, especially when rainfall intensities are low.

In one Fowlers Gap raingauge record spanning 1288 days, the total recorded rainfall was 697.5 mm. This fell on only 117 days (about 9% of days thus had rain). The average daily rainfall was just under 6 mm.

Using a 12-hour rainless period to separate storms, this record revealed that on average, the storms had lasted 6 hours and 18 minutes. The largest storm, in 2003, lasted nearly 32 hours and delivered 56 mm of rain. The average intensity through this storm was only 1.75 mm/h.

(For Sydney rainfall, though using slightly different criteria, Heneker et al. (2001) recorded a mean storm duration of 4.1 hours, and a mean storm rainfall of just over 7 mm (indicating an average storm intensity of about 1.75 mm). For Fowlers Gap the mean storm rainfall was found to be 12.7 mm.

Longer records from Fowlers Gap are needed to refine the results outlined here, and many others that have been derived. Issues that will be analysed as a longer period of high-resolution rainfall data becomes available include the following:

(1) seasonal differences in intensity-duration relationships (for example, the properties of summer convective storms compared with those of winter frontal rain)

(2) El Niño / La Niña related differences in intensity-duration relationships

In the medium- to long-term, global warming is expected to result in increases in common storm intensities, and records of intensity and storm properties will provide useful comparator data as global environmental change occurs. They may provide key information for the understanding of ecosystem responses to environmental change.

References:

Bidin K Chappell NA 2006. Characteristics of rain events at an inland locality in northeastern Borneo, Malaysia. *Hydrological Processes*. Available online; DOI 10.1002/hyp.6160.

Dunkerley DL 2000. Hydrologic effects of dryland shrubs: defining the spatial extent of modified soil water uptake rates at an Australian desert site. *Journal of Arid Environments* 45, 159-172.

Heneker TM Lambert MF & Kuczera G 2001. A point rainfall model for risk-based design. *Journal of Hydrology* 247, 54-71.

Zeng N Shuttleworth JW Gash JHC 2000. Influence of temporal variability of rainfall on interception loss. Part 1. Point analysis. *Journal of Hydrology* 228, 228-241.

CRC LEME's Regolith Geoscience Education & Training at Fowlers Gap, 2005

Investigators: Ian C. Roach[1] and Steven M. Hill[2]

[1]MCA Lecturer, CRC LEME, Department of Earth and Marine Sciences, Australian National University, ACT 0200.

[2]CRC LEME, School of Earth and Environmental Sciences, University of Adelaide, SA 5005

Fowlers Gap Arid Zone Research Station is an ideal research and training site because of its unique location in northwestern NSW. Research, teaching and learning can all be accomplished comfortably within the confines of the Station, but it also provides a great base for stepping further into the outback. Research problems at Fowlers Gap encompass many of those throughout central Australia and answers learned at the Station can be applied in many situations throughout the inland. For instance, Fowlers Gap has over 1.1 billion years of geological history during which this part of Australia changed from a deep ocean to volcanic island arc to terrestrial river basin to shallow sea to barrier range! The answers to many landscape evolution questions throughout central Australia lie within the confines of the Station boundary fence.

We have been training young geologists and environmental scientists at Fowlers Gap since 2003 because the Station gives students unique access to the world-class lead-zinc-silver (and NSW's sometime largest gold) deposit at Broken Hill, new mineral discoveries in South Australia, the goldfields of Tibooburra and the highly prospective Koonenberry area to the east and Thompson Fold Belt to the north. There are also many natural resource management issues that occur within and without the confines of the Station, including managing a delicate arid zone environment against the pressures of grazing and balancing that against dryland salinity and inland acid sulfate soil hazards.

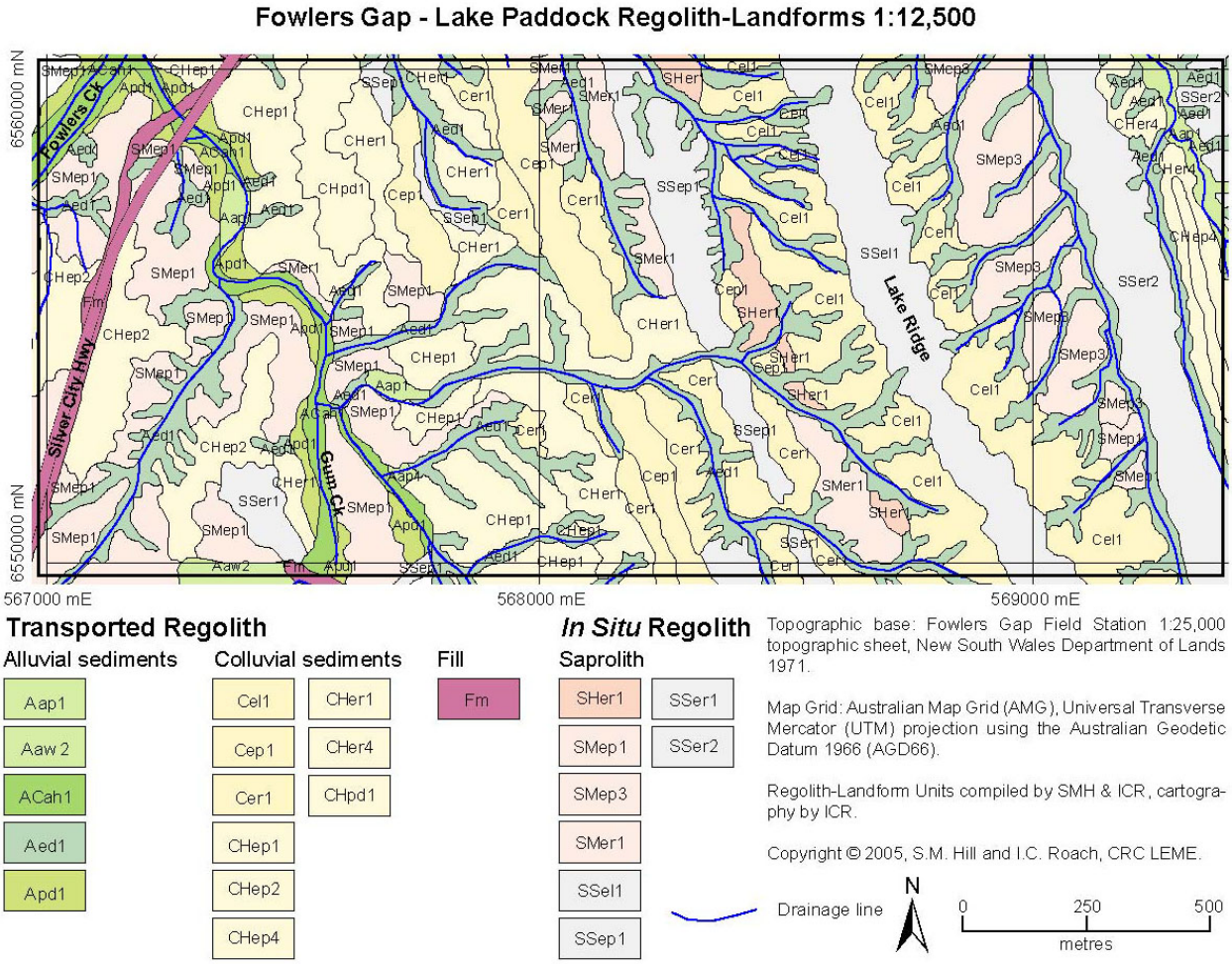
In 2005 CRC LEME ran two one-week field classes at Fowlers Gap aimed at 4th year and industry professionals, then undergraduate students. Despite the different target audiences the courses had the same fundamental objectives in that students learned to recognise regolith materials and their landscape settings; separate different regolith-landform units from one another based on this recognition; and, decipher the landscape evolution of the local area.

The first course, in March, taught regolith-landform mapping and landscape evolution skills to 4th year students from a number of Australian universities. Students attended the course

to learn new skills for careers primarily in the Australian and international minerals industry, giving them a tool-kit to help find new mineral deposits.

The second course, in July, was the second CRC LEME collaborative undergraduate regolith geology field school for students from the Australian National University and the University of Adelaide. Students came from a variety of backgrounds including geology, environmental science, engineering and resource management and took away different aspects of regolith to suit their respective disciplines. The results of that field class were published in Hill & Roach (2005).

In both courses, students left with a newfound appreciation of their environment. Results are being published as part of an on-going program of detailed regolith-landform mapping of the Station that so far has included Sandstone, Sandstone Ridge, South Sandstone, Conners and northern Lake paddocks.



Publications

Hill S.M. and Roach I.C. 2005. Regolith-landforms of northern Lake Paddock, Fowlers Gap Arid Zone Research Station, western NSW. *In:* Roach I.C. ed. *Regolith 2005 – Ten Years of CRC LEME*. CRC LEME, pp. 139-145. Available in hardcopy or on-line at http://crcleme.org.au/Pubs/monographs.html.

ILIRI Report to Fowlers Gap 2005

Investigators: Idris Murphy, Ian Grant, Louise Fowler-Smith, Peter Sharp, Joe Frost
College of Fine Arts, UNSW
PO Box 259, Paddington NSW 2021

Funding

The major development of 2005 for the ILIRI–Fowlers Gap partnership was the announcement in November that funding for the construction of studios at the Fowlers Gap Homestead Complex had been approved by the UNSW SAMAG Committee. An amount of $610,000 was announced, to provide for five large studio buildings, each housing two studios, planned for construction during 2006.

At the time of writing this Report (May 2006) the release of funds has been postponed, meaning that construction will not commence during 2006. However, ILIRI has received an assurance from the Chancellery that the Desert Studios Project still has its support, and is hopeful that 2007 will be the year of building studios at the Fowlers Gap Homestead Complex.

A private donor, Julian Beaumont, confirmed in November that he would donate $40,000 to ILIRI for the construction of a remote studio at Fowlers Gap, along the lines of the Ochre-House. This studio is planned for building during 2006.

Fowlers Gap Artists' Residencies

During 2005 ILIRI received a steady stream of enquiries from Australia and overseas regarding residencies at Fowlers Gap. Many of these enquiries resulted from the listing of ILIRI on the website of Res Artis, an international association of residential art centres that facilitates artists' residencies around the world. Many enquiries sought to ascertain whether the artists' travel and accommodation would be paid for by the hosting body, which is not the practise of ILIRI and Fowlers Gap. At the end of 2005 ILIRI had approved one residency for the Ochre House during April, 2006 (Ben Beeton, from Australia) and was soon to review applications from an American and a Canadian artist.

Research Activities

During 2005 the association of ILIRI and Fowlers Gap was advanced through the research activities of staff and postgraduate students and brought into the public eye by exhibitions and publications in Australia and overseas.

The exhibition 'Equilibrium of Contradictions', of recent paintings by ILIRI Director Idris Murphy, garnered a highly favourable review by John McDonald in the **Sydney Morning Herald** of September 10 – 11. Extensive mention was made of Fowlers Gap, as the site of Murphy's landscape work and as a facility for scientific and artistic research. This article was a breakthrough in reaching a broad public beyond the art and academic communities.

The 'Going Out There' exhibition at the Ivan Dougherty Gallery from October 20 to November 26 showcased ILIRI's longstanding relationship with Fowlers Gap. Twenty-three artists exhibited work produced at Fowlers Gap or in direct response to the experience of being resident at the Research Station. As Ian Grant, ILIRI Presiding Member wrote in the widely-disseminated exhibition catalogue: "For most of these city-based artists this was their first experience of the (desert) environment – and their first challenge to find adequate means of visual communication of their experience". The image of the Ochre House on the front cover of the catalogue is becoming a widely recognised symbol of Fowlers Gap and the field research ethos of ILIRI.

This image was conspicuous in Issue 9 of **Australian Art Review**, where the article 'A Thousand Miles of Silence' by Rod Pattenden explained ILIRI's research aims and the residency program at Fowlers Gap.

November 24 was the date of the **ILIRI Colloquium** at COFA. This was an opportunity to promote the use of the Ochre House and present the ILIRI vision to about forty artists, writers, and representatives of arts bodies. The evening was successful, with enthusiastic responses from participants.

An exhibition of artworks by ILIRI Research Students, 'Desert Space', was mounted at the Alliance Francaise, Canberra from November 30 – December 20. All of the work shown stemmed from the experience of visiting Fowlers Gap, which is central to these PHD and MFA candidates' research. (See accompanying research report.)

The association between ILIRI and Alliance Francaise has led to **a selection of work from 'Going Out There' to be exhibited at the Alliance Francaise in Paris** in early 2006. Idris Murphy and Louise Fowler-Smith will travel to France for the exhibition and meet with representatives of French art bodies and schools to further the cause of European artists taking up residencies at Fowlers Gap through ILIRI.

Genevieve McCrea

Having access to the research area has meant I have been able to relate my studio experiments with sand to the real landscape.

The absence of trees in this area provides greater understanding in the drawing process. Studies of the surface reveal a deeper understanding of the subterranean structure.

The freshness and expressive power of marks made by the dynamic processes of the earth is a strong motivating factor in this ongoing exploration. The land is a continuum of dynamic systems which build up and wear down in an interactive whole layer upon layer creating the forms we see.

Without trees and grass about, the stones and soil are free to interact with each other harmonizing and contrasting combining optically at a distance like pointillist brush marks.

Experiments with sand have provided a way to both explore and embody the self-organizing capacity of nature. My research work involves observing closely to the way nature itself works has renewed a sense of awe at the subtlety and genuine novelty of nature's marks and processes.

I was also surprised by the richness of the ground under my feet, which after millennia of weathering provides such variety, novelty, contrast and harmony in just one square meter.

Genevieve McCrea: Fowlers Gap VIII, acrylic and sand on board 25x20cm.