

1 Research Reports – 2004

Effects of upbringing and experience on herbivore diet selection in the Australian arid rangelands: Comparison between red and western grey kangaroos

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The diets and foraging behaviour of red (*Macropus rufus*) and western grey (*M. fuliginosus*) kangaroos were compared on Fowlers Gap Research Station in far western New South Wales. The study was carried out in spring (2003) and summer (2003-4) during very dry seasonal conditions which depleted the amount and variety of the vegetation available to herbivores. The kangaroos were classified according to their age (juveniles or adults), experience with the environment (introduced naïve, introduced experienced or resident wild) and rearing (hand or mother reared) and their foraging behaviour was compared with the predictions of the learning model for diet selection developed by Provenza (1990).

The diet of western grey kangaroos was primarily grasses whereas red kangaroos grazed more on dicots with grasses a secondary item. Grass, copperburr and forb were the main types of plants selected. No differences were found in plant types, plant parts or bite rates between the day and night foraging of individuals. However when the day/night behaviour was compared, western grey kangaroos shifted from monocots to dicots. Plants with physical defences were selected more than chemically defended plants. Overall red kangaroos grazed more on defended plants than western greys.

The learning model is based on the ability of herbivores to learn and adapt their dietary habits according to the positive and negative consequences of foraging. There are three central concepts: development of conditioned food aversions, the influence of social learning (mother and peers) and the nature of an individual's experience. This study focused on the two last concepts. Both the presence of peers and experience were shown to influence individual foraging patterns. However, for the kangaroos in this study, the temporal variation in pasture induced by seasonal conditions appeared to have the major influence on the diet selection.

Saving Wildlife- Saving People on Our Roads

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In Australia, there is a lack of detailed information on the spatio-temporal patterns and causal factors for wildlife-vehicle collisions. Furthermore, little is known about the effects that collisions may have on wildlife demographics. To address this deficiency of knowledge, we collected statistics on kangaroo-vehicle collisions, investigated the causal factors of these collisions, and surveyed the population structures and distributions of kangaroos over a period of 18 months. The research was conducted on Fowlers Gap Research Station in north-western New South Wales along a 21.2 km sealed section of the Silver City Highway between Broken Hill and Tibooburra. The average roadkill rate was 4 roadkills per month. Red, western and eastern grey kangaroos (*Macropus rufus*, *Macropus fuliginosus* and *Macropus giganteus* respectively) made up the majority of roadkills, with euros (*Macropus robustus erubescens*) killed less often. No bias towards any species was found as the species proportions of roadkills reflected those present in both the vicinity of the road and in the hinterland. Similarly, no sex biases were found for the kangaroo species examined. Roadkill

victims were mainly young individuals aged around 2 years old and this reflected the predominance of young animals generally found in kangaroo populations. The frequency of roadkills was influenced by kangaroo population density along the road, pasture growth along the road verge, the flight responses of the kangaroo species, and areas of dense shrub lining the road. This paper discusses the relationships between the causal factors and roadkill frequency and attempts to rate the relative importance of each factor for predicting the occurrence of roadkills.

Publications:

Lee, E., Kloecker, U., Croft, D.B. and Ramp, D. (2004). Kangaroo-vehicle collisions in Australia's sheep rangelands, during and following drought periods. *Australian Mammalogy* **26**, 215-226.

Behaviour of raptors, ravens and crows feeding at animal carcasses

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Little research has been done on scavenging activities in Australia due to the human aversion to decomposing matter and the lack of obligate scavengers like vultures that can be found in other countries. This study investigated the avian scavenging guild in a arid area of Australia and identified behavioural differences among different members in the guild. A total of 14 carcass stations were set up and all the activities of different scavengers at the carcass were recorded by a time-lapse video-recorder. Four avian species fed on these carcasses: the Australian raven (*Corvus coronoides*), wedge-tailed eagle (*Aquila audax*), black kite (*Milvus migrans*) and little eagle (*Hieraetus morphnoides*). The wedge-tailed eagle was the only species with sufficient strength to break into a carcass by itself. The Australian raven showed an association with the road as the source of carcasses, and vehicles traveling that road as the means of opening up a carcass. The inter-specific hierarchy at the carcass in a decreasing sequence of dominance was wedge-tailed eagle > little eagle > black kite > Australian raven. This hierarchy correlates with that expected from relative body mass. Carcasses beside the highway impose certain risks to the wedge-tailed eagle, which tended to stay at the carcass even as a car is approaching. Thus the wedge-tailed eagle is more likely than other avian scavengers to suffer injury or even death from feeding on carcasses on the road or verge.

Wildlife Tourism in Australia: Testing two wildlife-viewing strategies on free-living kangaroos in far western New South Wales and assessment of ecological effects

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The desire of a growing number of people to experience wildlife in its natural environment has resulted in an enormous demand for nature-based tourism. Whilst in recent years many countries worldwide have developed successful tours that offer a wildlife tourism that is sustainable, Australia has been less forthcoming to promote its wildlife of the Outback.

Our work examines two strategies that should guarantee the wildlife tourist a rewarding viewing experience with four large kangaroo species in far western New South Wales. We simulated the behaviour of tourists that encounter wild kangaroos in the field or

observe them from a viewing hide and documented the wildlife's responses to these strategies. We assessed the level of habituation of the kangaroo community and made predictions on the degree of disturbance tourists may have on these free-living macropods.

The results suggest that wildlife viewing may be more rewarding and less disturbing from a hide, because the generally unhabituated kangaroos were very reactive to ambulatory observers and responded with flight at large distances when being approached. The distinctive flight patterns of the four kangaroo species varied mainly in relation to cover and time of day. The information gained about the mechanisms of the flight behaviour of the kangaroos and their reactivity to human disturbance enables the development of a rewarding wildlife viewing framework that aims to improve the wildlife viewing experience and to make the wildlife tourism ecological sustainable.

Deterring kangaroos from roadside verges: Potential of the dingo bush (Eremophila microtheca)

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Wildlife roadkill accrues high economic and social costs to all Australians. Motor vehicle damage, human fatalities and passenger distress, high insurance premiums and loss of biodiversity all result from wildlife-vehicle collisions. We have formed a coalition between government agencies, animal welfare organisations and our research institution to strategically research roadkill. We have been gathering, collating and analysing statistics on collisions to identify causal factors and to develop predictive models of roadkill to target blackspots for mitigation. We will develop and apply effective abatement technologies to significantly reduce the incidence of roadkill. The result will be safer roads for us and our wildlife.

Amongst these aims is the identification of the most effective aversive stimulus, or combination of stimuli, to prevent road crossings by kangaroos during the passage of a vehicle. We have made intensive studies of the Silver City Hwy (Outback NSW), through roads in Royal National Park (urban-bush interface) and the Snowy Mountains Hwy (high traffic volume highway interfacing with protected areas). We have established causal factors for road kill along these routes. We have conducted studies of responses to head lights and wildlife reflectors with red and eastern grey kangaroos and red-necked wallabies, responses to artificial dog scent (PlantPlus) with eastern grey kangaroos, swamp and parma wallabies and red-necked pademelons, and we have designed a study to look responses to low frequency noises as generated by tyres rolling along roads. We have concluded that wildlife reflectors (Swareflex and Streiter-Lite) and light are relatively ineffectual in deterring macropods at roads. Aversive odours stimulating an anti-predator response seem more profitable but will be only cost-effective for small-scale intensive treatment of roadkill hotspots. More profitable may be natural odorous or aversive plants incorporated into roadside plantings and so we are investigating some possibilities such as 'Dingo bush' (*Eremophila microtheca*) in captive and field trials.

The Dingo bush emanates an odour reminiscent of a wet dog and so might be aversive to kangaroos based on their natural response to avoid areas where strong predator odours are detected. At Fowlers Gap we are testing foraging behaviour in the presence of dingo bush, a non-odorous native fuchsia (*Eremophila maculata*) or the absence of both. We have irrigated circular plots of 3-m diameter to attract kangaroos and planted them with either of the two *Eremophilas*. The study is continuing through 2005 with trials at watering points and with captive species at the Cowan Field Station.

The effects of European rabbit (*Oryctolagus cuniculus* L.) disturbance on invertebrate assemblages, with a focus on ants, at Fowlers Gap in the semi-arid zone of northwestern New South Wales.

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The effects of rabbit disturbance on an invertebrate assemblage in the arid zone of north-west New South Wales was assessed on a local scale. The distribution of invertebrates in association with the density and volume of two species of shrubs (*Maireana pyramidata* and *Rhagodia spinescens*) and nine ground cover classes (*Maireana pyramidata*, *Rhagodia spinescens*, *Sclerolaena*, Bare ground, Forbs, Herbs, Grass, Litter and Dung) was examined for differences between three rabbit warren treatments (Active, Abandoned and Control). Invertebrates were classified to morphospecies level, which was Order in most cases. The distribution of the most abundant morphospecies was examined in detail; these were ants of the Genera *Iridomyrmex*, *Camponotus* and *Rhytidoponera*. The Control treatment was found to have a significantly higher percent cover of Bare ground than the Active treatment, and the Active treatment had a significantly higher density and percent cover of *Maireana pyramidata* than in both the Abandoned and Control treatments. The volume of *Maireana pyramidata* shrubs was significantly higher in the Abandoned treatment than in the Active and Control treatments. A significant difference in pitfall trap morphospecies composition was discovered between each of the treatments following an Analysis of Similarity. A Canonical Correspondence Analysis revealed that bare ground was the only environmental variable that significantly explained the distribution of the invertebrate species between treatments.

Integrating sexual selection and the allocation of sex in the zebra finch: back to the outback

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The Australian zebra finch has become the primary avian model species in evolutionary biology studies in Europe and North America as the focus of classic laboratory-based studies of sexual selection, and sex allocation. Surprisingly, these studies have focused on populations of birds maintained in an unnatural environment and in captivity for decades that have been through tens of generations of artificial selection, the effects of which are unknown – not a trivial issue for students of evolution. We aim to redress this situation by studying these research areas with wild zebra finches breeding in their natural habitat at Fowlers Gap.

In 2004 (over three visits and about 8 weeks on the field station) we conducted some basic groundwork on zebra finches at Fowlers Gap to locate breeding colonies, measure basic reproductive parameters and investigate the population size and movement of birds through the area. Breeding densities were suitable for our study at four separate locations, all within a kilometre of permanent water and identified as areas in which research infrastructure will be established in 2005. This infrastructure will include water and feeding stations and predator-proof nest box towers as the focal points of further research effort on this species based at Fowlers. Experimental work will begin in the spring of 2005 and initially run for three years, supported by an ARC Discovery grant (Jan 2005- Dec 2007).

Habitat influences on chestnut-crowned babbler *Pomatostomus reficeps*

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The Chestnut-crowned babbler is one of four species of *Pomatostomus* babbler found in Australia, most prominently, arid eastern New South Wales. This is the only species of babbler found at Fowlers Gap, and is restricted to the hilly areas where both saltbush (*Atriplex* spp.) and casuarinas trees (*Casuarina* spp.) are found. Simon Griffith and I are setting up a long-term study on this species. The aim of this year was to determine the ranging behaviour of chestnut-crowned babblers and to use indices of habitat quality to investigate whether or not a lack of habitat of sufficient quality may cause this species to live in family groups. Much of the results were obtained by a team of students including Deborah Russell (Sheffield), Holly Barclay (Cambridge) and Dean Portelli (UNSW). Babblers bred from September to December in groups of 2 to 13 individuals, and ranging behaviour was restrictive during this period. Babblers preferred to nest/roost in large casuarinas over either mulga (*Acacia aueura*) or river-red gum (*Eucalyptus camaldulensis*), and preferred creek areas to non-creek areas. Foraging was most commonly done on the ground, also along dry creek beds, although they did forage in casuarinas and mulga. We found no evidence to suggest that insects were in greater abundance along creek beds, but we did find greater amounts of saltbush and casuarinas, suggesting that babblers prefer creek bed areas because of the greater ability to hide and evade predators.

Within our 9 km² field site at Fowlers Gap, we identified 25 potential territories, but only 15 were occupied. Territories are fairly obvious in that they are typically in valley areas, separated by raised areas which are devoid of trees. Unoccupied territories were areas of valley habitat in excess of the average size of occupied territories where the presence of nests has shown babblers to have lived previously. We found no evidence to suggest that unoccupied territories had more or larger casuarinas, greater amounts of vegetation, including saltbush, or greater availability of insects. Groups in the unoccupied areas may have gone extinct, possibly due to the recent droughts, but this extinction appears to be independent of habitat quality. Since vacant habitat of suitable quality appears not to be limiting at Fowlers Gap, we suggest that that dispersal of offspring is not constrained by a lack of habitat of suitable quality (as is commonly suggested), and family living in the chestnut-crowned babbler is a function of some benefit of group living (possible communal roosting).

Is Moulting an Inherently Costly and Inefficient Process? An examination of Moulting in White-plumed Honeyeaters and House Sparrows.

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At Fowlers Gap, White-plumed honeyeaters (WPHE; *Lichenostomus penicillatus*) may breed throughout the year and do so without interrupting moult. Given that the separation of moult and breeding in most north-temperate species is believed to be due to energetic tradeoffs, this raises the question: is moult less costly in species that display moult/breeding overlap than in those that segregate these events? The energetic cost of moult in WPHE and House Sparrows (*Passer domesticus*) were estimated from rises in basal metabolic rate (BMR) above pre-moult levels during their respective natural moult periods. Birds were held in captivity for the duration of moult, with moult progression and BMR (estimated from overnight measures of O₂ consumption within the birds' thermal neutral zone) measured weekly.

Total moult costs for HS were not quantified as this species was only approximately halfway through moult at the time of thesis submission. Total cost of feather production over the moult period in captive WPHE (497 kJ·g dry feathers⁻¹; n=7), was very similar to costs reported for similar-sized birds from predictable north-temperate environments. Thus, regardless of life-history pattern, there appears to be a strong relationship between moult cost (C_f) and mass-specific metabolic rate (BMR_m) in all species studied to date (C_f = 309 (BMR_m)^{1.11}; r²=0.967, p=<0.0001).

WPHE, however, displayed a moult duration more than twice that expected for their BMR_m, which reduced their daily moult costs to 40% of predicted values. Thus, reduction of moult rate rather than reduced total moult costs appears to be the main difference between WPHE and species with moult/breeding segregation. Given that maximum increases in BMR during moult (68% above pre-moult levels) did not coincide with maximum feather replacement, we suggest that moult costs may not reflect the actual cost of feather replacement. We further tested this by forcing 12 birds to replace 25% of their plumage by simulating moult through plucking. Even though simulated moult treatment overlapped with the early stages of natural moult in WPHE, maximum BMR increases in simulated moult birds were no greater than in naturally moulting conspecifics (F 1,21=0.005; p=0.944). Further, feather growth rates of simulated moult birds were statistically indistinguishable from moulting birds (p>0.2). These results indicate that feather replacement *per se* is not an energetically demanding process rather than an annual regeneration of tissues that are coincident with moult contributes markedly to the apparent cost of moult. Apart from energetic considerations, a number of ecological pressures are thought to influence the timing of moult in a bird's annual cycle, facilitating moult/breeding overlap in some species, while enforcing the segregation of these events in others.

CRC LEME's Regolith Geoscience Education and Training at Fowlers Gap

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Fowlers Gap Arid Zone Research Station is a great location to train young geologists and environmental scientists. It is ideally placed in northwestern New South Wales, giving students 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 and Thompson Fold Belt to the east. The region also highlights many natural resource management issues such as the delicacy of the arid zone environment and how to balance that against dryland salinity and inland acid sulfate soils hazards.

CRC LEME has been introducing tertiary students and minerals industry professionals to arid zone mineral exploration and natural resource management issues in the comfort of the Station. A spin-off of this program is a new understanding of the landscape evolution of northwest NSW as well as an on-going program of detailed regolith-landform mapping of the Station that so far has included Sandstone, Sandstone Ridge, South Sandstone and Conners paddocks.

In 2004 CRC LEME ran two week-long field classes at Fowlers Gap. The classes were aimed at different target audiences but contained the same fundamental objectives:

- to be able to recognise regolith materials and their landscape settings;
- to learn to separate different regolith-landform units from one another based on this recognition; and,
- to decipher the landscape evolution of the local area.

The first course, in March, taught regolith-landform mapping 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. Being able to map regolith-landforms and determine landscape evolution history are important skills for finding and ranking new exploration targets, and for being able to determine real from false mineral anomalies.

The second course, in September, was the first CRC LEME collaborative undergraduate regolith geology field school for students from the Australian National University and the University of Adelaide, described in Hill *et al.* (2004). 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.

In both courses, students left with a newfound appreciation of the environment. They are now able to see the land with new eyes and have gained a deeper understanding of rocks and mineral weathering and surface process thanks to their time spent at Fowlers Gap.

Publications:

Hill S.M., Roach I.C. & Field J.B. 2004. A collaborative undergraduate field school for regolith geoscience at Fowlers Gap, western NSW: 2004 a regolith odyssey. *In:* Roach I.C. ed. *Advances in Regolith*. CRC LEME, pp. 134-139. Available at <http://crlceme.org.au/Pubs/monographs.html>.

Modern fluvial process and prior landscape history in an arid-zone river: Fowlers Creek, New South Wales, Australia.

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Fowlers Creek is a small arid-zone ephemeral river. It has five fluvial styles, spread over three geomorphic subregions: the Uplands (the source of the creek's water and sediment), the Trunk (the central reaches, constrained by outcrop), and the Terminal Floodout (where it diminishes and disappears).

Fowlers Creek is dominated by fine sediments, including a high proportion of mud aggregates which directly influence the fluvial style.

In the proximal Uplands, the creek is a discontinuous ephemeral stream, showing a sequence of channel types (gully-arroyo-intermediate floodout). The fluvial processes fluctuate around the threshold between valley-floor strength and channel incision. The sediments are dominated by floodplain muds and flat-lying sheetflow deposits. The intermediate floodouts are pinned at tributary confluences, reflecting formation during large floods, and are identified as key components of the ecological landscape

In the mid-Uplands, the creek forms a mobile-channel, unstable-floodplain assemblage. The fluvial processes are chaotic and threshold-driven, characterised by catastrophic reach-scale channel relocation. Sediments are a patchwork of fine floodplain deposits around shoestring sands.

In the Trunk, Fowlers Creek shows coexisting anabranching and pool-and-riffle morphologies. Fluvial characteristics (e.g. channel number, type, and capacity, channel and floodplain roughness, hydraulic radius) are highly variable, indicating very complex flow dynamics.

In the Terminal Floodout, the channel is meandering, and fluvial deposits include point bars and overbanks. In the proximal and central Floodout fan-head autocyclic and/or underlying tectonic influences promote channel incision as well as meandering.

Although it has been postulated that the rivers of western NSW have undergone a complete change of style as a result of widespread post-European erosion, the present study shows that the modern fluvial styles are not different from those of the past. Instead, severe but localised erosion along linear landscape disturbances has increased erosion in some parts of an already-unstable system.

The Fowlers Gap GIS Datasets

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Three MapInfo datasets have been created for the use of Fowlers Gap researchers, comprising Geoscience Australia 1:250,000 topographic GIS data (e.g. roads, drainage, contours, etc.; Geocentric Datum of Australia (GDA94) and Australian Height Datum (AHD)). They can be used to supplement digital data (e.g. remote sensing datasets), or as a base for plotting field data (e.g. nest locations).

They are arranged in the following sets: 1) two whole maps: a combination of the Broken Hill (SH54-15) and Cobham Lake (SH 54-11) 1:250,000 topographic maps; 2) the northern Barrier Range area; and 3) Fowlers and Sandy Creeks only.

These GIS datasets were created in MapInfo v. 7, and MapInfo (a widely-available commercial product) will be needed to manipulate the data. The datasets can be viewed using MapInfo ProViewer, a free download (www.mapinfo.com). ProViewer.exe (the installation file) is supplied with the Fowlers Gap datasets in the folder Software_ProViewer, and can be installed on the reader's computer by following the directions in ProViewer78.pdf. ProViewer is supplied in good faith but the suitability of this software for the reader's computer is the reader's responsibility.

The original topographic data was supplied as a free download by Geoscience Australia (<http://www.ga.gov.au>). Geoscience Australia requires the following copyright statement to accompany products derived from their datasets:

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Evaluation of alternative ram types for lamb breeder: finisher systems in the low rainfall zone

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The Project aims to compare sire types and examine a breeder and finisher system for producers in the low rainfall zone. Traditional Merino types will be compared for breeding of lambs from Merino ewes, and the lambs will be weaned and grown out on a property in South Australia which will have pasture suitable for growing out lambs.

The objectives are:

1. Generate lambs by three sources from Merino ewes bred and run under normal pastoral zone management at the Fowlers Gap research station.
2. Wean the lambs at an appropriate age and transfer to a finishing property in South Australia.
3. Obtain grow-out data on the lambs, allowing evaluation of the alternative sire types.

Rams were sourced from Centre Plus and Leahcim studs. The rationale for the selection of these studs for pastoral lamb production studies is explained by Richard Apps (MLA) as follows:

‘Centre Plus have many years’ data on a range of traits including body weight, fleece traits, FEC and scrotal circumference, and more recently scan data on carcass traits. By Merino standards they also have a significant volume of full pedigree, hence enabling better handling of maternal traits for dual purpose selection. Most sires used in recent years rate in the top 15 - 20% of our analysis on the dual purpose 8% MP index. Leahcim have a shorter recording history but are also recording a full range of traits, not just wool traits, and recent sire teams have rated well on the 8% MP index.’

Rams were collected from Centre Plus on 15 November 2003 and Leahcim 18 November 2003 in separate journeys to avoid stress. Rams had a period of around one month to acclimate to conditions in far west NSW where temperatures were moderate to high and feed levels were sound.

All rams (Table 1) were paddock joined in syndicates of 4 rams to 200 MA Fowlers Gap ewes on 16/12/03

Table 1. Ram sources and identities

Syndicate	Tag numbers
Fowlers Gap (controls)	01-419, 01-367, 00-200, 99-222
Centre Plus	107445, 107647, 107216, 107366
Leahcim	20663, 20178, 20436, 20790

Estimated breeding values (EBVs) for Centre Plus and Leahcim as a percentage on 8% MP Dual Purpose Index are listed in table 2. For the Fowlers Gap controls they are presented as Fibre Diameter (FD) and Clean Fleece Weight (CFW) % deviation [they may be converted to EBV's by multiplying by respective heritabilities] (Table 3). Fowlers Gap rams have all been processed by fleece measurement only

Table 2. Estimated Breeding Values for Centre Plus and Leahcim rams.

Source	Tag	Dual purpose 8% MP index (%)
Centre Plus	107445	128
	107647	117
	107216	113
	107366	112
Leahcim	20663	99
	20178	101
	20436	106

Table 3. Estimated breeding values for Fowlers Gap control rams.

Source	Tag	% deviation CFW	% deviation FD
Fowlers Gap	01-419	93	98
	01-367	101	117
	00-200	114	104
	99-222	124	101

Mating mobs were kept separate for 56 days for joining, and there after ultra-sounding of ewes was used to assess ewes still not pregnant and late conceptions due to late cycling in a summer joining. This procedure tested the adequacy of 6-week versus 8-week joining in the pastoral zone under typically variable seasons.

Lambing commenced in mid-May in 2004. At lambing, ewes were put back into their joining paddocks for 42 days + 17days and lambs were weaned at an appropriate weight. All ewes were boxed after lambing to avoid paddock effects.

Weaning was in mid-October 2004 at shearing. The number of lambs per sire group, and the weaning weight of all lambs were recorded. Lambs were then be transported to Mt Bryant in two shipments (the second to pick up the stragglers) when they were about 25 kg fasted live-weight. There after all lambs will be weighed monthly (three weights expected including the final live weight) until dispatch in 2005.

At dispatch, all lambs will ideally to go at the same time, but a back-up is to have two or more drafts for slaughter. Lambs will be live weighed a final time, and carcass weight and GR depth (or yield if available) will be obtained from the works on each of the treatment groups.

Lambing results August 2004

1 Centreplus mob: East Warrens Paddock

- Ewes at lamb-marking = 182
- Lambs at lamb-marking = 103-- 51 wether lambs for finishing
- Lamb-marking % (LM) = 56.6%
- No. 'wet' ewes = 77 (42%)
- No. 'dry' ewes = 105 (58%)
- Lambs expected from scanning = 183
- Lambs lost (estimate) = 183 – 103 = 80
- % (Lambs lost/expected) = 44% *

2. Controls Fowlers Gap mob: Lake Paddock

- Ewes at lamb-marking = 200
- Lambs at lamb-marking = 215---107 wether lambs for finishing
- Lamb-marking % (LM) = 107.5%
- No. 'wet' ewes = 164 (82%)
- No. 'dry' ewes = 36 (18%)
- Lambs expected from scanning = 303
- Lambs lost (estimate) = 303 – 215 = 88
- % (Lambs lost/expected) = 29%

3 Leahcim mob: Warrens Paddock

- Ewes at lamb-marking = 211
- Lambs at lamb-marking = 186---93 wether lambs for finishing

- Lamb-marking % (LM) = 88.2%
- No. 'wet' ewes = 152 (72%)
- No. 'dry' ewes = 59 (28%)
- Lambs expected from scanning = 299
- Lambs lost (estimate) = 299 – 186 = 113
- % (Lambs lost/expected) = 38%

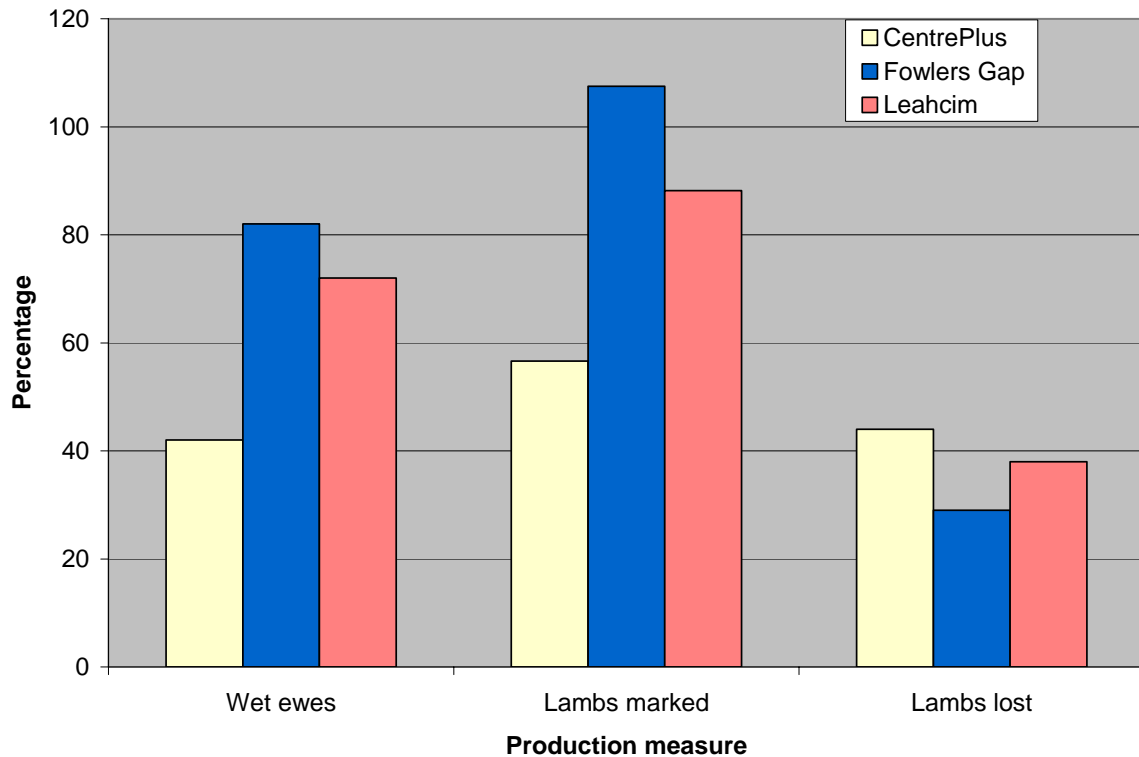


Fig. 1. Comparison of key production indicators across sires.

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ILIRI Report to Fowlers Gap 2004

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During 2004, COFA's Imaging the Land International Research Institute (ILIRI) continued to promote the Fowlers Gap Artists-in-Residence Program, with a view to gaining funding for the construction of studio buildings at the Research Station and the formal establishment of the Program. ILIRI secretary Joe Frost received an average of two international enquiries per week regarding the Artists-in-Residence Program, mainly from artists who have read about Fowlers Gap on the Res Artis (International Affiliation of Residential Art Centres) website. Through media coverage, exhibitions and the forging of relationships with other (particularly overseas) arts institutions, ILIRI has sought to promote the Fowlers Gap Artists-in-Residence Program.

A television segment about the ILIRI-Fowlers Gap partnership was aired on Foxtel's 'Moor Gardening' Program late in 2004. This featured extensive interviews with Dr. Idris Murphy and Louise Fowler-Smith in various locations on the Research Station. As well as explaining the significant role played by Fowlers Gap in scientific and artistic research, and education, this television program presented extensive footage of the Fowlers Gap

environment. Fowlers Gap was introduced to a large public within the context of rethinking western concepts of landscaping and gardening.

The 'Imaging the Land' exhibition of work created during the ILIRI Field Trip of 2004 was a key event of the COFA Spring Fair of September 2004. Looking forward, Dr. Idris Murphy's exhibitions of new paintings, in Sydney in August and Melbourne in September 2005, will feature several major Fowlers Gap works. In addition to the local attention this will attract, a full colour publication with a brief essay will disseminate these images to interstate and international audiences.

In association with the French Cultural Attaché to Australia, Sydney Peyroles, an exhibition of artworks created at or in response to Fowlers Gap will be staged at the Alliance Francaise in Canberra, in September 2005. This prefigures a similar ILIRI/Fowlers Gap exhibition that will travel to the Alliance Francaise in Paris during 2006.

The Cultural Attaché has expressed, in writing, his enthusiasm for the possibility of exchange programs between ILIRI and French arts institutions that would see more European artists travelling to Fowlers Gap to work. He is keen to ensure that the Program is financially viable, and is likely to assist in lobbying relevant bodies for the funding of some expenses for visiting artists.

Three brief descriptions of COFA research projects, involving work done in residence at Fowlers Gap, follow.

Juliana O'Dean

Masters by Research in Painting

Thesis (working title): The Enduring Quality of Stone and its Symbolism in Human Culture
"Stone is a central material in human history, one of three universal symbols found in every primitive culture, where its primary meaning is the self or soul. My research seeks to examine both the enduring quality of stone and its dichotomous appearance as a symbol of the energetic, ephemeral core of the human being. My visits to Fowlers Gap have been crucial to the development of my work. My stay in 2004 resulted in the imagery which comprises my Masters' work."

Rochelle Haley

Masters by Research in Painting

Thesis: Land Incorporated

"My project investigates the representation of people's relationships to land. Using a series of linear drawings my work aims to document my passage through the landscape as I travel by foot and in vehicles. Incorporating knowledge about the land from disciplines outside of art (e.g. cartography, landscape architecture) I am seeking a more varied 'view' or way of seeing the land."

Sue Soliman

Masters by Research in Painting

Thesis: The Outback – An Unmapped Metaphorical Landscape

"I am looking at the Australian desert as a place where man defines and reinvents his identity through a profound relationship with nature."