

## Outcomes of the EMU Project to April 2004

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### Context

The Ecosystem Management Understanding (EMU) Project developed through the Gascoyne-Murchison Strategy (GMS). It commenced in mid-2000 and has received considerable and widespread support from a range of rangeland stakeholders including the Central Agricultural and Pastoral Aboriginal Corporation, the Conservation Council of Western Australia and the Pastoralists and Graziers Association. It is also formally included in the Joint Commonwealth State Agreement for the National Heritage Trust and is recommended as a pilot for rangelands in the State Sustainability Strategy for Western Australia released last year. Furthermore, the NHT Rangelands Working Group has commissioned us to support sub-regional Natural Resources Management planning using our technical knowledge and participatory processes.

The project is at a critical stage. As it is expanding and looking for a second phase of secure funding in order to retain recently engaged staff under training, we have been questioned by representatives from two Western Australian Government agencies, as to whether EMU represents a good investment of Commonwealth funds. This is a report I probably should have provided at an earlier date. I am also organising a further evaluation based on surveying participants by somebody outside of the project, similar to one conducted previously (Shallcross 2002).

### EMU in a regional environmental management context

In this briefing I hope to indicate that the active nature conservation conducted by landholders consequent of our project is a major paradigm shift and contribution to nature conservation in the rangelands to complement expansion of the National Reserve System. Indeed, it could be argued that through the Gascoyne-Murchison Strategy's Regional Environmental Management Programme, we have a working regional model built around several key complementary activities (Pringle, Tinley *et al.* 2003):

1. Acquisition of pastoral leases to expand the National Reserve System (Tony Brandis' excellent work),
2. Conservation priority planning on reserved lands (CALM/EMU collaboration)
3. Support for private conservation organisations who have purchased pastoral leases (e.g. the southern Yalgoo "biosphere" project)
4. Development of specific off-reserve biodiversity management projects (e.g. EnviroFund projects, Indigenous Protected Areas)
5. Development of EMU Process-based ecologically sustainable pastoral management model that is spreading quickly (eight new participating leases in the last week)

6. Internationally certified Environmental Management Systems, soon to be linked with an EMS-based approach to catchment and regional management and investment (Pringle and Hopkins in press).

### **EMU as an efficient investment for on-ground conservation**

It should be noted that for most of the EMU Project's life, there have only been two officers involved, both of whom have had additional responsibilities to rolling out the "EMU Process" amongst pastoralists.

Hugh Pringle:

- was also Manager of the Regional Environmental Management Programme (Pringle, Tinley *et al.* 2003) of the GMS, and
- helped both Departments of Agriculture and Conservation and Land Management technically (landscape ecology and management support),
- as well as providing technical support for the development of property-level Environmental Management Systems
- and helping to develop EnviroFund submissions with pastoralists (with 6/6 successful).

Ken Tinley:

- was also responsible for doing a detailed hierarchical assessment of biodiversity values across the GMS, including aerial photographic interpretation of the entire region (Tinley submitted),
- conducted salient feature mapping of acquired leases with departing lessees, and
- provided technical advice and training to CALM regional staff.

It should be noted that while we have recently engaged three new staff via NHT funding, this expansion slowed us down until very recently, as training others is less efficient than just getting on with jobs. We have had support from State Government agencies, but have spent at least as much time helping them meet their goals.

### **The EMU Process: Driving a progressive paradigm shift**

Perhaps the least easily quantified, but most profound change that has occurred has been in the outlook and management of participating pastoralists. After a recent AGM of the Murchison Land Conservation District Committee, secretary Meg Officer noted that she found it hard to believe how much the agenda had changed in the three years since her group engaged the EMU Team. Following three failed winters, Meg was astonished that pastoralists wanted to expand and fast-track catchment and key habitat activities. Three years ago, biodiversity was almost a dirty word, now it is central to their discussions and co-operative activities. Kathryn Mitchell from Yalgoo LCDC suggests that since participating in EMU she has changed the way she thinks about the land so much that she finds it difficult to recall how she used to think about it. Chatter around barbecues often include topics such as "empty layers of vegetation", "replacement processes", "standing dead species", "monocrops" and "Ken's wet spots".

People are seeing and managing the rangelands differently; we really are on the brink of an ecologically managed Outback. We need support to encourage and spread this critical paradigm shift.

## **EMU Involvement with State agencies**

### *Department of Agriculture*

Hugh Pringle is now largely DAWA funded (post GMS)

I have helped run a workshop for Pastoral Lease Inspectors to increase their landscape literacy and the consequent value of their reporting.

We have also spent considerable time with district officers helping us organise activities, and they show signs of improved landscape literacy and skills in communicating with pastoralists, as well as a better understanding of how biodiversity and pastoralism can co-exist.

The Regional Director and Department Executive has strongly supported our initiatives to date, as have District Leaders.

### *Department of Conservation and Land Management*

Ken Tinley is now funded by CALM (post GMS)

Ken Tinley has spent considerable time capturing local pastoralists' knowledge on acquired pastoral leases, which could be used in identifying management priorities and developing integrated conservation management plans.

We have run an EMU for conservation reserves workshop for the Geraldton Regional Office at an acquired lease (Muggon station).

Interest has been expressed from district officers in the Kalgoorlie region to become better acquainted with the EMU Process on CALM lands and with groups of pastoralists.

There is recent interest within the Science Division for exposure to our practical landscape processes principles and expertise

The Mid-West Regional Director has strongly supported our initiatives to date and David Blood has indicated that he will help with catchment restoration projects.

The cost of managing millions of hectares over vast regions is considerable and CALM faces a major challenge in providing the intensity of land management that may have existed before Government acquisition. Yet it could be argued that nature reservation needs that kind of committed management, but that would in turn need considerably more new money than is apparently available to CALM regional offices. It is difficult to see how CALM could actively manage its vested estate according to EMU principles given the scarce resources it has at its disposal presently. After public liability and good neighbour issues have been addressed, there may not be many resources for active conservation management.

We would like to help where we can. After all, Ken Tinley developed the underpinning management system of EMU when he was responsible for conservation in big reserves across southern Africa. It has been adapted for pastoralism; its roots are in conservation.

### *Water and Rivers Commission*

The supervising officer for the Murchison supported strongly the Murchison River Restoration Project, but asked that WRC responsibilities be formally taken on by Ken Tinley and me (we agreed) as resources were tight

A district officer is now committed to supporting the Roderick River Restoration Project (20% time allocation)

### *Department of Planning and Infrastructure*

Remote sensing staff have been extremely helpful in providing imagery at short notice. A surveyor has volunteered to help capture critical base levels in the Roderick River Restoration Project, particularly with respect to the nationally listed Wooleen Lakes Wetlands.

In summary, the Department of Agriculture is clearly our strongest partner as far as commitment of resources is concerned. The Department of Planning and Infrastructure has been very helpful and the Waters and Rivers Commission have committed an NHT facilitator to support the Roderick River Restoration Project as part of his duties. We are not as effectively engaged with CALM regional staff as we would like to be regarding nature conservation on reserved and leasehold land. The Mid-West Regional Manager has however asked for a meeting to discuss future engagement and we hope to build closer operational ties in the near future.

### **Catchment management projects**

Three big projects are underway, which address ecosystem health at the scales of catchment causes and solutions, rather than trying to fix symptoms within landscapes (Pringle and Tinley 2003).

#### 1. The Murchison River Restoration Project

EMU was initially called in for technical advice in developing a funding submission. The relationships we developed with the participants led to this project changing from a focus on fencing and grazing management on the floodplain, to include catchment management and special management of key biodiversity assets (Murchison Land Conservation District Committee and the Ecosystem Management Unit 2002). The Department Of Agriculture's officers at the Meekatharra District Office were instrumental in getting the project funded and continue to provide substantial support.

#### 2. The Roderick River Restoration Project

This is a project initiated by two pastoralists involved in the Murchison River Restoration Project who, having accepted the seriousness of catchment dysfunction, wanted to try to heal a sub-catchment using EMU principles, as a learning process for the whole catchment.

Funding for on-ground works through NHT to the tune of \$100,000 is imminent and the Desert Knowledge Co-operative Research Centre is about to sign off on about \$250,000 to fund a project officer, PhD students and some inter-state travel for participants.

The Aboriginal community at Pia Wadjarra is engaged and there is a strong probability that they will be involved in on-ground activities (at least).

Department of Agriculture and Waters and Rivers Commission staff have been involved in the preliminary phases of the project.

#### 3. Gascoyne Headwaters Project

This project is currently confidential, but involves catchment and floodplain management, destocking, on-ground works and strong formal support and substantial involvement by the local Aboriginal community. A pastoral company and a mining company largely fund it. State Government district officers have not been involved to date. The Department of Agriculture has offered local assistance and the Executive has given in-principle support.

### **Changes that have occurred on stations (or are probable, as noted specifically)**

One of the critical factors that has led to a level of demand for our services that we cannot meet is the assurance of confidentiality that was endorsed by State Government agency representatives during the Gascoyne-Murchison Strategy. Therefore, I relate outcomes with numbers for the pastoral leases (stations), and am happy to provide evidence that what I declare has occurred. I ask that readers try NOT to predict which stations are which below, because we need to support both our ethical relationships and the work that they are doing.

1. Closed down watering points in degraded areas to release grazing threats  
Volunteered to leave a very diverse eucalypt woodland remote from artificial watering points to protect from grazing pressure
2. Changed locations of proposed watering points for which grants had been received to prevent erosion of fragile landscapes  
Sought and received support in developing a grazing strategy based on resting and grazing different landscapes according to their ecological context to support replacement processes and avoid degradation
3. Destocked about half of the station, which was fragile and degraded and had been the source of much conflict with Government to allow recovery  
Now internationally certified with an EMS module
4. Installation of several more landscape monitoring sites to assess sustainability  
Internationally certified with an EMS module  
Prepared to participate in a catchment effort to restore floodplains if neighbours will too (problems from up-slope)
5. Volunteered to keep a large section of the property undeveloped because its land systems were not in the NRS  
Developed a feral goat control programme to avoid further degradation and aid recovery of fragile landscapes
6. Internationally certified with an EMS  
Gully restoration trials as a prelude to more systematic restoration of catchment functioning  
Exclosure to protect rare plant populations and specific feral goat control measures through ENVIROFUNDS  
Publication of pastoralists' perspective on biodiversity and responsible management as an industry beacon
7. Expected by June:  
Exclosure of several hundred hectares of land systems outside the reserve system, and gully stabilisation within the area  
Exclosure and trap yard around an area of breakaways with rare flora, caveat to remain water remote
8. Destocked most of station after EMU visit, with few remaining stock to meet lease conditions  
Gradually stabilising massive gully systems in drainage system
9. Surveillance of run-on habitats in land system not within reserve system to safeguard threatened, distinctive biodiversity
10. Proposed realignment of gas pipeline route to fit, rather than fight ecosystems
11. Mapping of ephemeral wetlands, their status, interventions to protect them and effectiveness, to safeguard threatened, distinctive biodiversity  
Proposed valley-side terrain sequence exclosure to protect from grazing a representative on-station reserve

- Fencing to separate floodplains and valley side to limit preferential floodplain grazing and degradation
12. Proposed protection of most ecologically diverse part of station from grazing as an on-station reserve
    - Fencing to separate floodplains and valley side to limit preferential floodplain grazing and degradation
    - Sold all sheep that were run in old stock route area to allow recovery
    - Received help to eradicate mesquite in river system
  13. Extended period of destocking of whole lease to allow recovery
    - Fencing to separate floodplains and valley side to limit preferential floodplain grazing and degradation
    - Looking to nature conservation buyers before putting lease on the open market in the hope of extending period of recovery and perpetual conservation management
  14. Fencing off floodplain to limit preferential grazing and degradation
    - Proposed river flooding restoration activity to encourage more frequent and prolonged flooding
  15. EnviroFund success for management of a nationally listed wetland
    - Destocked half of station due to ecological condition, to allow recovery
  16. Floodplain fencing to limit preferential floodplain grazing and degradation
    - Wooleen Lakes conservation project to prevent erosion and leakage, as well as to dampen down energy of run-on flows
    - Exclosure protection for other natural and indigenous heritage assets
    - Co-founder of the Roderick River Restoration Project
  17. Floodplain fencing to limit preferential floodplain grazing and degradation
    - Requested assistance in developing ecology-based grazing strategies, to allow recovery of degraded landscapes
    - Removed all watering points from within river floodplains to enable strategic destocking
    - Co-founder of the Roderick River Restoration Project
  18. Floodplain fencing to limit preferential floodplain grazing and degradation
    - Destocked due to seasonal and ecological conditions to prevent degradation
    - Proposal for restoring flooding to floodplain
  19. River fencing to limit preferential floodplain grazing and degradation
    - Sought assistance in developing ecological grazing management to protect fertile bottomlands and allow general recovery
    - Fencing within paddocks to protect threatened ecological communities from cattle pads that were driving scrub encroachment
    - Virtually destocked until ecological plan in place, including all fencing
  20. Floodplain restoration plan developed, seeking funding assistance
  21. Indigenous Protected Area declaration imminent in continentally significant ecjunction with many rare biota
    - Feral goat control programme to protect critical conservation values
  22. Headwaters restoration project planned, funded, imminent (this week) to protect critical drought buffering habitats with distinctive biodiversity
    - Restoration and fencing off of critical habitats and landscape control points
    - Strong local indigenous support and participation (copy of letter of support available)
  23. Restoration of threatened ecological community undergoing scrub encroachment
    - Valley-side flow mitigation works
  24. Major creek restoration plan, imminent

25. Biodiversity monitoring programme in newly developed area (Richardson and Pringle in press)  
Published ecological early warning paper (McQuie 2002)  
Host EMU training for UWA students  
Negotiated several formal conservation outcomes with local CALM office  
Restoration trial in fragile breakaway system  
Proposed restoration programme for a major creek and its catchment  
Provide management for adjacent CALM lands in co-operation with local CALM office (Kalgoorlie); not strictly an EMU outcome
26. Planned restoration of drainage systems disrupted by abandoned railway line  
Major creek system restoration planned
27. Breakaway protection plan in place  
Nationally listed wetland management plan in place, infrastructure completed
28. Track induced water starvation being corrected systematically to halt desiccation  
Ecological grazing management strategy to allow recovery
29. Two major creek restoration plans developed, including rare flora and ephemeral wetlands  
Trials commenced in habitat restoration and protection  
Sought assistance in developing ecological grazing management strategies
30. Commenced breakaways to salt lake restoration/stabilisation project as local demonstration/trial  
Sought assistance in developing ecological grazing management strategies
31. Amended drainage management plan for imminent mining operations  
Sought assistance in developing ecological grazing management strategies
32. Drainage management planning in progress  
Feral goat control plan developed
33. Station destocked until ecological management plan completed and implemented  
Sought assistance in developing ecological grazing management strategies  
Many watering points to be moved away from fragile areas  
Feral goat management plan in place for creek pools habitats
34. Biodiversity conservation plan developed with EMU
35. Cross-boundary nature conservation planning with neighbour after EMU workshop.

Ken Tinley and I are not aware of any conservation initiatives that are specifically consequent of our (EMU) help to date on lands acquired by CALM, though cases may well exist.

### **Groups with whom EMU works**

Apart from the major formal restoration projects discussed previously, we are helping other groups achieve outcomes together:

1. *Rangelands Fibre and Produce Association (near Mt Magnet)*  
Pilot EMS completed successfully, internationally certified and independently re-audited  
Requests for help in upgrading EMS to make it more user-friendly and PR-oriented  
Requests for training in website technology to promote their environmental credentials  
Two EnviroFunds successfully sought involving interventions to safeguard biodiversity

- Provided advice on proposed gas pipeline alignment and construction  
Provided advice on main road impacts on surface drainage
2. *Central Agricultural and Pastoral Aboriginal Corporation*  
Held an initial overlay mapping demonstration  
Working with two stations, including the IPA case  
Interest in further EMU workshops from ILM Facilitator
  3. *Yalgoo LCDC*  
Request for help to develop an environmental management plan for the LCDC
  4. *Southern Yalgoo "Biosphere" group*  
Supporting a group of pastoral lessees to develop internal and cross-boundary biodiversity plans  
Potential for adjacent CALM-acquired properties to participate if interested
  5. *WMC Resources Pastoral Division*  
The overall manager of eight contiguous leases has inquired about developing individual and a precinct environmental plan based around EMS
  6. *UWA School of Agriculture and Natural Resources*  
EMU and the Centre for Management of Arid Environments co-ordinates lectures and runs a field trip for senior undergraduates in land literacy and management to address deficiencies in these skills in graduates in W.A.
  7. *Auas-Oanaob Conservancy*  
Predominantly during our annual leave, we are working on ecosystem management with a group of pastoralists in a conservancy southwest of Windhoek in Namibia. We also did a voluntary consultancy on Etosha National Park in Namibia.

## **Conclusion**

The EMU Team and its participants' work represents the vast majority of *active* ('hands on') conservation being carried out in the region in which we work. I hope that the amount of work completed and change we have supported indicates that we have been a sound investment of taxpayers' money. Not only have we completed an enormous amount of work, we have also generated enthusiasm for ecological management; a paradigm shift in outlook and management actions that are gathering momentum.

We provide a major complementary service to CALM's reserve acquisition and management programme in terms of regional biodiversity and ecosystem management. We would like to help more with reserve management in future, but remain a strictly voluntary project for all clients, irrespective of tenure.

We have also participatorily diagnosed and started addressing a previously overlooked ecological process that threatens both the pastoral industry and ecosystems and their wildlife; canalisation of drainage networks driven by landscape incision and cascading, headward gully retreat (Pringle and Tinley 2003). These processes are not restricted to pastoral leases, but that is where they are being addressed at present.

I request support in seeking funding for additional staff over periods longer than a year (after which trainees are only just likely to be able to work without direct supervision and may be looking elsewhere for job security). We are quite happy to

take people to meet our partners in the rangelands and see for themselves the initiatives documented above.

We also look forward to forging closer working relationships with all State Government agencies; ecologists are thin on the ground in the rangelands and we need to work together for optimal outcomes. We need to see each other through; not see through each other.

## **Publications and Products**

### *Refereed papers*

Pringle, H. J. R. (2002). Grazing impacts in rangelands: Assessment of two contrasting land types in arid Western Australia from different land management perspectives. PhD Thesis, Research School of Biological Sciences, Australian National University, Canberra.

Pringle, H. J. R. and Tinley, K. L. (2003). Are we overlooking critical geomorphic determinants of landscape change in Australian rangelands? *Ecological Management and Restoration* **4**, 180-186.

Pringle, H. J. R. and Landsberg, J. (2004). Predicting the distribution of livestock grazing pressure in rangelands. *AustralEcology* **29**, 31-39.

Pringle, H. J. R., Watson, I. W., and Tinley, K. L. (in prep.). Rangeland improvement, or ongoing degradation? Reconciling apparent contradictions from the arid rangelands of Western Australia. Paper awaiting diagrams, ready for submission to an international journal.

Pringle, H. J. R. and Tinley, K. L. (In prep). Assessing catchment functional integrity in the Gascoyne-Murchison region of Western Australia.

### *Participant's publications*

Dowden, F., Dowden, J., Dowden, A., and Dowden, D. (2002). What is biodiversity? From the pastoralist viewpoint. In: Nicolson, S. and Wilcox, D. G. (editors); *Shifting Camp: Proceedings of the 12th Biennial Australian Rangeland Society Conference*, pp. 130-134.

McQuie, D. (2002). Ecological Grazing Management: The Bulga Downs Story. In: Nicolson, S. and Wilcox, D. G. (editors); *Shifting Camp: Proceedings of the 12th Biennial Australian Rangeland Society Conference*, pp. 260-264.

Murchison Land Conservation District Committee and the Ecosystem Management Unit (2002). The Murchison River Project: Pastoralists restoring health to the Murchison River catchment. In: Nicolson, S. and Wilcox, D. G. (editors); *Shifting Camp: Proceedings of the 12th Biennial Australian Rangeland Society Conference*, pp. 312-313.

### *Videos*

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Burke, G. (2002). Quality and Environmental Assurance. A video produced by Production Function for the Gascoyne-Murchison Strategy for the Gascoyne-Murchison Strategy, Western Australia, Fremantle, Western Australia.

*International Conference Papers*

Pringle, H. J. R., Tinley, K. L., Brandis, T., Hopkins, A. J. M., Lewis, M., and Taylor L. (2003). The Gascoyne-Murchison Strategy: A people-centred approach to conservation in arid Australia. Invited paper for the International Rangelands Congress 2003, Durban, South Africa.

*National Conference papers*

Pringle, H.J.R. and Hopkins, A.J.M. (in press). Biodiversity monitoring or biodiversity management systems: Which is the cart and which is the horse. Proceedings of the 13<sup>th</sup> Biennial Australian Rangelands Conference, July 2004, Alice Springs.

Pringle, H. and Tinley, K. (2001). Landholders designing with nature: an approach to off-reserve conservation in the Gascoyne-Murchison Strategy area, Western Australia. Proceedings of the Northern Australia Beef Industry Conference, pp 49-53.

Pringle, H. J. R. (2002). The Regional Environmental Management Program of the Gascoyne-Murchison Strategy. In: Nicolson, S. and Wilcox, D. G. (editors); *Shifting Camp: Proceedings of the 12th Biennial Australian Rangeland Society Conference*, pp 338-339.

Pringle, H. J. R., Lewis, M., Hopkins, A. J. M., and Curry, P. J. (2002) A preliminary sustainability framework for the Gascoyne-Murchison Region of Western Australia. In: Nicolson, S. and Wilcox, D. G. (editors); *Shifting Camp: Proceedings of the 12th Biennial Australian Rangeland Society Conference*, pp 336-337.

Pringle, H. J. R., Morrissey, T., Morrissey, R., Mitchell, R., Mitchell, K., Tinley, K., Blood, D. A., and Jaensch, R. (2000). Planning ecologically sustainable pastoral management through the Gascoyne Murchison Strategy. Centenary Biennial Conference of the Australian Rangeland Society.

Richardson, J. and Pringle, H.J.R. (in press). Deleterious impacts on aspects of biodiversity on breakaway habitats. Proceedings of the 13<sup>th</sup> Biennial Australian Rangelands Conference, July 2004, Alice Springs.

Taylor, L. J. (2002). Environmental management systems and 'clean, green' pastoralism. In: Nicolson, S. and Wilcox, D. G. (editors); *Shifting Camp: Proceedings of the 12th Biennial Australian Rangeland Society Conference*, pp. 347-348.

Tinley, K. (2001). Scrub encroachment of productive grasslands: soil moisture balance. Proceedings of the Northern Australia Beef Industry Conference, pp. 11-16.

Tinley, K. L. and Pringle, H. J. R. (2002). What is the EMU Exercise? Shifting Camp: Proceedings of the 12th Biennial Australian Rangeland Society Conference, pp. 349-350.

Watson, I. and Thomas, P. (2002). The Western Australian Rangeland Monitoring System (WARMS) shows widespread improvement in perennial vegetation across the Gascoyne-Murchison Strategy region of Western Australia. Shifting Camp: Proceedings of the 12th Biennial Australian Rangeland Society Conference, pp. 362-363.

#### *Other publications and reports*

Hopkins, A. J. M. and Watson, I. (2001). Case Study 2. Biodiversity monitoring in the Gascoyne-Murchison Strategy area. In: Whitehead, P, Fisher, A., Fensham, R., and Beggs K. Developing an analytical framework for monitoring biodiversity in Australia's rangelands. Tropical Savannas Co-operative Research Centre, Darwin for the National Land and Water Audit.

Landsberg, J., Smyth, A., Ferrier, S., Hopkins, A., and Richardson, J. (2003). Appendix F: Guiding principles for an operational framework for regional monitoring of rangeland biodiversity. In 'Biodiversity monitoring in the rangelands. A way forward. Volume 1. Edited by A. Smyth, C. James, and G. Whiteman. pp. 41-48. Centre for Arid Zone Research, CSIRO Sustainable Ecosystems: Alice Springs.

Pringle, H. and Tinley, K. (2001). Ecological sustainability for pastoral management. *Journal of Agriculture Western Australia* **42**, 30-35.

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