

ecological SUSTAINABILITY FOR PASTORAL MANAGEMENT

Pastoralists and rangeland bureaucracies are now required to operate within the limits of ecological sustainability. However, while the concept of ecological sustainability has been enshrined in law and policy at State and Commonwealth levels in Australia, there has been little translation into pastoral management objectives.

The introduction of the 'EMU (Ecosystem Management Unit) process', as an equal partnership between ecologists and pastoralists, promises to bring pastoralists into close dialogue with the landscapes they manage on their stations, and to acknowledge and manage for values other than pasture production. In doing so, pastoralists are likely to increase production, reduce costs, and ensure greater market access. *Dr Hugh Pringle¹ and Dr Ken Tinley² report.*



Through the EMU process, examining vegetation either side of fence-lines is one method of understanding the impacts of grazing management on native ecosystems. The photos above demonstrate the vivid contrast in vegetation that can be discovered, and therefore applied to ecologically sustainable pastoral development.

1a, above – the jam tree has been grazed up to the maximum reach of stock, lacks an understorey, and has exposed and degraded soil. Most biodiversity is long gone, and ecologically sustainable pastoralism is not occurring.

1b, above right - in contrast, this jam tree has intact foliage and a vibrant understorey of bird-dispersed species thanks to replacement processes, which are critical to pastoral management.



Scrutiny from the wider community is intensifying on the rangelands, and emerging market issues such as access and premiums will become increasingly contingent upon demonstrated environmental responsibility. In this context, the EMU process represents an opportunity for pastoralists to adopt a proactive approach in securing their future on the land.

The EMU name draws on the emu bird, whose battle with pastoralists' fences is symbolic of the traditional management approach based on conquering and subjugating landscapes. The EMU process instead offers the opportunity to work with nature rather than against it - allowing nature to carry on while pastoralists make strategic and well-considered management interventions.

Through consultation between pastoralists and ecologists, the EMU process addresses the compatibility of good habitat for stock with

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good habitat for many other plants and animals. The essence of the EMU process is working with ecologists to map critical management issues and factors on clear overlays of station maps showing land systems (country types).

Pastoralists are recognised as local experts in land management and their accumulated wisdom is the basis of the process. The ecologists are 'on tap', rather than 'on top' - a change in relationship that pastoralists appreciate.

The process also provides a framework and tools for ongoing management that can improve the 'triple bottom line'. That is, while the process has a focus on landscape management, it is considered within social, cultural and economic contexts.

Evolution of the EMU process

The EMU process developed within the Off-Reserve Conservation Project of the Gascoyne-Murchison Strategy's (GMS) Regional Environmental Management Program (REMP). The GMS is an initiative of the Commonwealth Regional Partnership Program and is funded by the Commonwealth and State Governments, and industry. The REMP has given itself the task of developing a prototype for regional delivery of ecologically sustainable development, which includes ecologically sustainable pastoral management.

The Off-Reserve Conservation Project initially planned to focus on formal off-reserve agreements. What resulted was a 'grassroots' approach with pastoralists to identify regional priorities. The consultation was based largely on Ken Tinley's decades of experience in working with rural communities around the world to solve environmental problems. Thus evolved the EMU process.

The inaugural exercise was held at Thundelarra station and the follow-up at Barnong station. Such was the enthusiasm generated through these trial exercises that it was decided to test the process further. It was quickly recognised there was a need to switch from individual station activities to workshops with up to six stations, followed by visits to individual stations. To date, 15 stations have been involved and nearly double that number have registered interest in undertaking the process.



There is a tradition of looking for causes and solutions in the immediate vicinity of identified problems. However, aerial photographs can reveal a more complex story related to landscape processes, particularly drainage of floodplains.

2a, top - breached levee banks are quickly draining this grassy floodplain, evidenced by the migration of 'woody weeds' into the floodplain and away from the billabong, along breaches of the levee bank. Note also the gully head cutting back towards the billabong. Unless stabilised, it will cut into and drain the billabong, which is a vital resource for native birds and animals.

*2b, centre - on the ground, the breached banks have resulted in bardi bushes (*Acacia victoriae*) starting to thicken up adjacent to the bank. Notice the smaller shrubs in the left-background nearer the migrating edge of scrubland.*

*2c, lower - in another area, the process is complete and bardi bush and camel thorn (*Acacia farnesiana*) have formed impenetrable thickets.*



The degradation documented through rangeland surveys of the GMS region relates to both biodiversity and pastoral values. The EMU process aims to help pastoralists to improve their awareness of ecosystem components and linkages, and in so doing enhance the triple bottom line of rangeland management.

Comparison of 3a and 3b using short-term and long-term attributes from the landscape monitoring system (noted below) highlights how the monitoring process can help pastoralists track changes in the health of the landscape. In the examples above, 3a (top) represents an unhealthy state and 3b represents a healthy state:

- *Mature-aged 'monocrop' (3a) versus species-rich community with multiple replacement sequences (species completing their life cycles under grazing management) (3b).*
- *Much bare soil – scalded in parts, some bush mounds with small erosion faces (3a) versus better cover of shrubs and stable or accreting bush mounds (3b).*
- *No juveniles (3a) versus a sprinkling of juveniles of several palatable perennial species (3b).*
- *Most shrubs heavily grazed and not able to set seed (3a) versus most species lightly grazed and many seeding (3b).*
- *Very little leaf litter except recent leaf drop (3a) versus much litter under shrubs (3b).*

Diversity and inter-connectedness

The EMU process is based on the need for *diversity* in managed ecosystems. It encourages pastoralists to recognise that diverse systems have many components that can respond when one component is removed or severely reduced.

When systems (such as a landscape) are reduced to a few apparently easily managed components, severe disruption to one can throw the whole system into chaos with destructive results because there are no 'reserves'.

The EMU process emphasises that diversity depends on the process of *replacement*, which means allowing systems to absorb and recover from the effects of grazing. While it would be impractical to harvest goods and services from our ecosystems without losing at least some diversity, there is a need to recognise the *inter-connectedness* of diversity, and how a reasonable level of diversity is necessary to maintain the integrity of managed ecosystems (see photos 1a and 1b).

In addition, diversity and inter-connectedness fundamentally affect the way rangelands are patterned and interact at larger scales, such as toposequences and catchments. When taking flights with pastoralists over their stations to assess land management issues, there have been examples of problems where the cause is a long distance away from the symptom that was first recognised (see photos 2a, 2b and 2c).

The need for integrated catchment management in farming country has long been recognised. While stations have been managed largely in isolation, partly due to their size, pastoralists appear individually keen to help each other out. The EMU process helps pastoralists understand the management problems and opportunities available to their stations in relation to their neighbours, and highlights their place in the catchment as a whole.

Accordingly, future rangeland use may be in the form of traditional grazing, more diverse types of livestock, more sophisticated grazing systems (eg. systems based on shifting livestock more often to rest paddocks), or multiple land uses that can be accommodated within an integrated ecosystem management context.

Major phases within the EMU process

The process is loosely structured and flexible. It allows for creative interaction between pastoralists and EMU members, but has major phases to ensure that comprehensive outcomes are achieved. The major phases are discussed below:



The EMU process involves taking flights with station owners whenever possible to identify priority issues. For example, this aerial view clearly demonstrates that wattles have increased at the expense of understorey saltbushes on the left-hand side of the fence-line due to overgrazing in the early years of pastoral development. This transition from a saltbush shrubland to an accacia woodland has left few perennial shrubs, which are necessary for survival in drought conditions.



Fran Dowden (Challa station) and Laurie Jensen (Yoweragabbie station) discuss key features mapped on the Yoweragabbie station plan at a workshop held recently in Mt Magnet.

i) Introduction

This brief phase involves introductions and a discussion of what participants would like from the process and what can be offered. A general outline is charted and referred to as the process proceeds.

ii) Discussion of ecosystems and landscape management

This is done by way of examples and questioning participants about major driving influences in local rangelands. 'Teaching' is kept to a minimum and illustrated examples and photographs are preferred over verbal descriptions.

iii) Pastoralist mapping of salient features on clear overlays over coloured land system maps of stations

All members of the family/management structure are encouraged to participate and understand how each other perceives the same area of rangelands (station). In particular, husband and wife partnerships are very productive and inter-generational involvement can lead to a greater appreciation of common ground and objectives.

Examples of the information mapped by pastoralists on overlays at workshops is listed in Table 1.

Table 1. Core themes (overlays) and their salient features.

Theme	Salient features/occurrence of
Pastoral factors	<ol style="list-style-type: none"> 1. Best pastoral value country (for what and why) 2. Lowest pastoral value country (for what and why) 3. Artificial watering points and pipelines 4. Longest lasting natural surface waters (include dams) 5. Least grazed areas (furthest from water)
Landscape linkages	<ol style="list-style-type: none"> 1. Main drainage systems onto, through and out of station 2. Main breakaway scarps and ridge-lines 3. Unique or unusual features/scenic areas 4. Areas where many landscape types come together
Degradation hazards and occurrence	<ol style="list-style-type: none"> 1. Main areas of severe degradation and erosion 2. Main areas of scrub encroachment 3. Most fragile/sensitive landscapes

iv) Field visits to investigate mapped issues

The range of issues mapped on the station are visited in the field. This provides a chance to discuss critical landscape processes (eg. sheet flow, overbank flooding or wind erosion) and how landscapes are linked (eg. coastal sand

Uncontrolled feral goats represent a serious threat to biodiversity and pastoral resources in fragile landscapes, such as in the photos shown.

(Left) – located near a watering point. This breakaway system has been stripped of vegetation by feral goats and much topsoil has been lost, leaving saline subsoil.

(Right) - in contrast, at a location a few kilometres away from the watering point, the effects of grazing on shrubs are noticeable, although the system remains healthy.



encroaching on hinterlands). It is during the field visits that critical features of ecosystem management are discussed, such as identifying key palatable species and how they are dispersed, whether mainly by wind, water, ants or birds. Problem areas are also visited to determine whether local factors are the cause, or if there are interacting influences, perhaps up or down slope.

v) Identification of priority management areas and issues based on coincidence of salient features

Priority areas can be determined from the location of salient features, such as those listed in Table 1. The linkages between these features provide a simple but profound basis for understanding some of the driving influences on any station, and beg closer attention to where they coincide.

vi) Discussion of priority management areas and issues

Where many priority management areas occur within a station, there may be a need to formally undertake a priority-setting process according to criteria such as urgency and importance. Importantly, a realistic time frame needs to be developed so that pastoralists do not feel they have to solve many complicated issues in the short term. Some issues are inherently long-term as a consequence of the slow pace at which change occurs in many rangelands (Noble, 1986), particularly degraded ones in arid areas (Hacker, 1989).

In most cases, pastoral and conservation values coincide, but occasionally they will not. Incompatibility with biodiversity must be recognised and discussed within the broader implications of meeting station, district and regional environmental objectives.

vii) Discussion of monitoring to track progress

Critical areas on stations to be monitored are identified by assessing the information captured

in the mapping process. Pastoralists and 'the EMU' process have been developing a 'finger on the pulse' landscape monitoring system to be applied in these areas. Each monitoring area has been selected with a particular issue or question in mind, and involves assessing a range of short-term ('early warning') and long-term factors (see photos 3a and 3b).

Pastoralists are strongly encouraged to maintain any monitoring activities they may have been conducting on their stations in the past. The longer the record of change, the more they can learn about the relationship between management and landscapes. The EMU monitoring should be seen as complementary to any pre-existing monitoring, rather than as a replacement.

viii) Sustaining the process

The EMU process generates extraordinary enthusiasm, but there needs to be follow up in order to maintain momentum. It is critical there is continuity of support for pastoralists who have chosen to address ecological sustainability in a systematic way.

The EMU's core is at present an officer from the Department of Agriculture and an officer from CALM. There has also been considerable support from the department's pastoral inspectors, with nearly four million hectares already covered, and many more expected before NHT Bushcare funding runs out in November 2001.

As a very small team, visiting and providing support to all interested pastoralists is not possible. The challenge is to mobilise local officers in the Department of Agriculture and CALM to help interested pastoralists become mentors for their district, where the EMU experts are only needed to address specific issues and help plan progress as groups mature.

Links with other initiatives

One of the most profound contributions the EMU process can make is to help pastoralists take responsibility for their environmental credentials, and therefore ensure market access and premiums in discriminating markets where a certified 'clean and green' status is preferred. Pastoralists have been given the opportunity to demonstrate their environmental credentials by translating the 'EMU process' into a formal Environmental Management System (EMS) through the accreditation process of the Gascoyne-Murchison Strategy.

The Conservation Council of Western Australia and the Australian Conservation Foundation have expressed in principle support for the approach, and have sought information on how the process is providing positive environmental outcomes. There is a real possibility of strategic support in the market place if it can be demonstrated that equal partnerships are working and producing tangible benefits.

At the same time, there is a danger in attempting to associate the EMU process with 'policing' of the rangelands on behalf of government. This might result in pastoralists losing interest in ecological sustainability. There needs to be some distance from the strict regulatory functions of government if the EMU process is to contribute to a reduction in the degradation issues confronting pastoralists.

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