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NATURAL RESOURCE MANAGEMENT IN SEMIARID RANGELANDS BEGINS WITH CONTROLLING TOTAL GRAZING PRESSURE

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ABSTRACT

Prior to the widespread development of permanent watering points across the WA semi-arid rangelands, kangaroo grazing pressure was largely moderated by access to ephemeral water supply. Unlimited, continual access to permanent water sources by western grey kangaroos (*Macropus fuliginosus*) has enhanced their capacity to remain in areas in excessive numbers during extended dry periods. Excessive kangaroo grazing pressure along with procrastination on de-stocking decisions during these critical periods of pasture establishment and recruitment has stifled the post-drought recovery phase of high value land-systems on many stations.

The Cue Land Conservation District Committee (LCDC) comprises six pastoral stations who collectively manage 500 000 ha of Western Australian (WA) semi-arid rangelands. The Cue LCDC is seeking to reduce the level of impact that total grazing pressure has at critical periods on a regional level through integrating grazing management strategies (rest-based systems) and proven technologies (total grazing management yards, exclusion fencing and regeneration works). The major strength of their approach is they are looking beyond their own individual cadastral boundaries to identify the regional 'hot spots' that will be targeted over the coming years. These regional 'hot spots' are defined as those in which the economic and ecological return will be the highest by investing in improved infrastructure and regeneration works. As a part of the approach, stations are implementing rest-based grazing strategies to facilitate the re-establishment of perennial grasses and shrubs and introduce productive native grasses that have been largely removed from the system. An investment by the Commonwealth Government of \$85 610 for the first year of operation has been principally used for regional planning and on-ground works.

INCREASE IN KANGAROO POPULATION DISTRIBUTION AND DENSITY

Apart from being the logo of Australia's largest airline and an internationally recognized icon for foreign tourists, the kangaroo also has the capacity to be a major environmental menace when its populations are not managed in the WA semi-arid rangelands (Norbury, 1992, Hacker *et al.* 2000, Caughley *et al.* 1990). Although there are varied opinions about the actual extent to which western grey kangaroo populations have increased since early settlement in the WA southern rangelands, there is general recognition that numbers have certainly increased, despite punctuated fluctuations resulting from extreme seasonal episodes (Caughley *et al.* 1990). It is well documented that a major driving factor for this substantial increase in total populations was the development of permanent watering points into areas which were historically grazed only when ephemeral, surface waters were present (Caughley *et al.* 1990).

The combined effect of excessive grazing pressure by domestic (cattle, sheep and managed goats) and non-domestic stock (kangaroos, donkeys and camels) during dry periods has resulted in a significant reduction in the carrying capacity of large tracts of the WA southern rangelands.

The region is subjected to significant variation in pasture biomass as a result of a highly variable climate. Previous studies indicate that damage caused by total grazing pressure to arid pastures is more pronounced and terminal during extended dry seasons when there is reduced groundcover and the system is most vulnerable (Hacker and Hodgkinson 1995). These findings are well supported by observations by the Cue LCDC in which they report localized concentrations of western grey kangaroos and unmanaged goats heavily grazing desirable pasture species throughout extended dry periods, thereby reducing their root reserves and capacity to respond to effective rainfall.

THE IMPACT OF TOTAL GRAZING PRESSURE ON THE CUE LAND CONSERVATION DISTRICT

The members have observed that western grey kangaroos in the Cue region prefer the alluvial washplain and hardpan country during good seasons, particularly with above average summer rainfall as there will be an abundance of palatable grasses (both annual and perennial). Specifically, the group report that western grey kangaroos in the Cue region prefer the Millex land-system (plains on granite, with irregularly distributed low sandy banks and saline alluvial plains) and the Trillbar land-system (gently sloping stony plains with low rises of metamorphic rocks and gilgaied drainage foci). Plant species preferred by kangaroos in the Cue region include: limestone grass (*Enneapogon caerulescens*), claypan grass (*Eriachne flaccida*), silky browntop (*Eulalia fulva*) and silver speargrass (*Stipa elegantissima*).

At the commencement of the project, the Cue LCDC held a planning workshop which developed a regional strategy for the control of total grazing pressure in the Cue region which is effectively acting as a “road-map” guiding the group’s investment and plans over the next three years of the National Landcare Program (NLP) project and beyond. This regional strategy was developed through integrating existing scientific research, land survey data and local observation and experience of pastoralists.

Through the workshop process the total non-domestic grazing pressure (only kangaroos and unmanaged goats) over the total 429 500 ha Cue LCDC project area, was estimated to be 13 611 DSE. The area directly impacted by kangaroos and unmanaged goats was estimated to be 283 150 ha, hence in the impacted area the non-domestic grazing pressure was calculated as 1 per 20 ha. Given that recommended stocking rates for the region in good seasons average between 1 per 15-30 ha this non-domestic grazing pressure is significant. The combined gross income that four stations are currently forgoing due to uncontrolled non-domestic grazing pressure is estimated at \$612 495/year. These values are alarmingly high and provide an indication of the impact of uncontrolled non-domestic pressure on both land condition and business profitability.

CUE LCDC’S APPROACH TO MANAGING TOTAL GRAZING PRESSURE

The concept of controlling permanent water supplies through various innovative designs has been the focus of extensive research over the years and indeed the reason for endless hours of inventing in pastoralists’ workshops. However, despite now having an array of proven technologies and strategies to control total grazing pressure, the issue remains largely unabated. The main advantage that the Cue LCDC has in addressing this ongoing issue is the

group is seeking to address it on a regional basis, extending beyond their own individual cadastral boundaries. This approach is based on the firm recognition that an individual station could make a tireless effort to manage the populations at acceptable levels and yet simply create a 'sink' for surrounding populations.

Figure 1 illustrates the way in which the various components of the group's strategy link together in order to achieve their long-term goals of sustainable production systems which foster the regeneration of perennial shrub and grass species and improves biodiversity in the Cue region.

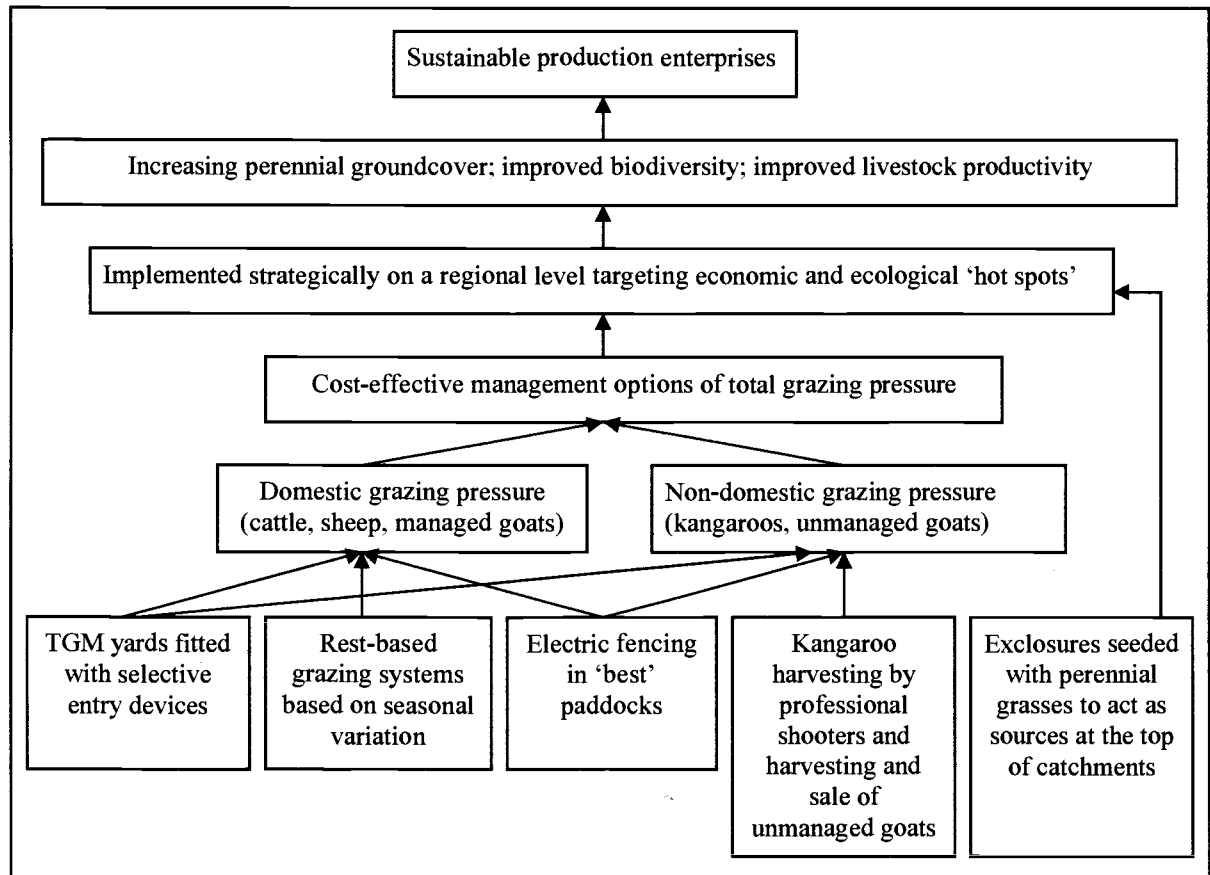


Figure 1: Cue LCDC strategy to manage total grazing pressure

MANAGING TOTAL GRAZING PRESSURE TO ACHIEVE NRM OUTCOMES

The Cue LCDC recognise that domestic livestock have the potential to be as equally destructive an impediment to the post-drought recovery phase of the resource as kangaroos, and hence are employing rest-based grazing systems. A legitimate and common argument that many pastoralists attest is that there is little benefit in resting pastures because the paddock simply becomes a 'sink' for other grazers. To manage this threat when the group rest paddocks they are also restricting access to watering points through installation of TGM yards and shutting down windmills and pumps. It is recognized that in reasonable seasons, this strategy will be less effective as kangaroos will be able to obtain water from ephemeral pools. However, during good seasons the need to manage kangaroo populations is not seen to be of critical importance because the availability of feed should be adequate. Paddocks with high pasture value have been fenced off with 7-wire electric fencing to restrict access of non-domestic grazers, however this is limited to small areas due to the marginal returns on investment.

Professional kangaroo shooters also play a role in the overall strategy of managing populations at acceptable levels. Regular mustering and sale of unmanaged goats also has a major contribution to a reduction in total grazing pressure and pastoralists recognise they must be vigilant given goats adaptability and high reproductive capacity even in poor seasons.

One of the innovations the group will be trialing is a selective entry device which was designed and has been informally tested by Jim Addison from the Department of Agriculture and Food WA (Kalgoorlie) and Ian McGregor (Yerilla Station). Figure 2 illustrates the blueprints of the selective entry device which is mounted in the front of the in-gate of TGM yards to limit ingress of kangaroos at permanent watering points.

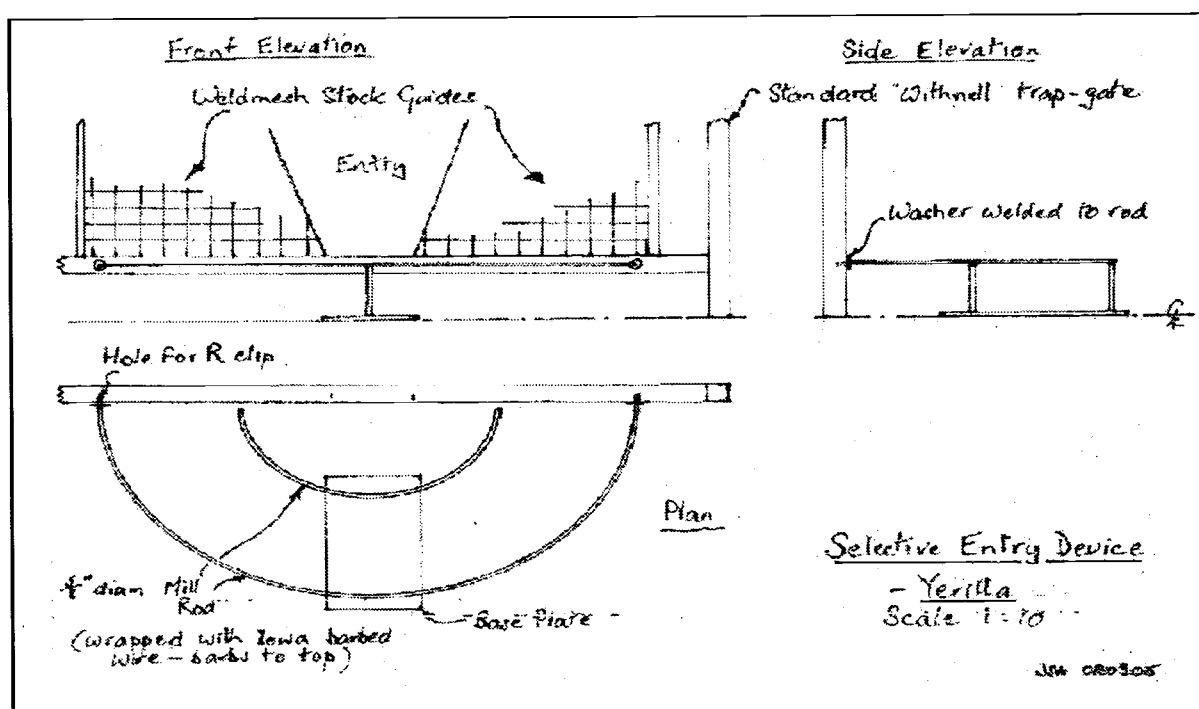


Figure 2: Jim Addison and Ian McGregor design of selective entry device to be fitted on the in-gates of TGM yards

In semiarid rangelands the most fundamental element of natural resource management is the maintenance of perennial ground cover and biologically active soils. Therefore strategies and technologies which cost-effectively manage total grazing pressure, particularly in the post-drought recovery phase, are likely to have the greatest impact and return on investment for both industry and government agencies.

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