



University of Kentucky
UKnowledge

International Grassland Congress Proceedings

XXI International Grassland Congress / VIII
International Rangeland Congress

Commercial Grazing versus Peri-Urbanisation: Comparisons of Landscape Condition

Cam K. McDonald
CSIRO, Australia

Neil D. MacLeod
CSIRO, Australia

John G. McIvor
CSIRO, Australia

F. Kearney
CSIRO, Australia

Follow this and additional works at: <https://uknowledge.uky.edu/igc>



Part of the [Plant Sciences Commons](#), and the [Soil Science Commons](#)

This document is available at <https://uknowledge.uky.edu/igc/21/17-1/20>

The XXI International Grassland Congress / VIII International Rangeland Congress took place in Hohhot, China from June 29 through July 5, 2008.

Proceedings edited by Organizing Committee of 2008 IGC/IRC Conference

Published by Guangdong People's Publishing House

This Event is brought to you for free and open access by the Plant and Soil Sciences at UKnowledge. It has been accepted for inclusion in International Grassland Congress Proceedings by an authorized administrator of UKnowledge. For more information, please contact UKnowledge@lsv.uky.edu.

Commercial grazing versus peri-urbanisation : comparisons of landscape condition

C.K. McDonald, N.D. MacLeod, J.G. McIvor and F. Kearney

CSIRO Sustainable Ecosystems, 306 Carmody Road, St Lucia, Qld 4067, Australia, E-mail: cam.mcdonald@csiro.au

Key words : ecosystem function, biodiversity, grazing, catchment, peri-urban

Introduction In coastal and sub-coastal areas of eastern and southern Australia, former commercial grazing lands are being rapidly sub-divided into small holdings of only a few hectares for mainly residential or lifestyle purposes (peri-urbanisation). Some commercial activity occurs, but the intensification of closer settlement puts considerable pressure on remnant native vegetation and riparian zones, typically at a scale much less than that at which landscape ecological processes operate (MacLeod 2007). While there are principles for landscape design and sustainable management under commercial grazing, their appropriateness for the scale and multiple activities of peri-urban areas is unclear. This paper compares data from two separate studies on landscape condition under these two scenarios and relates the results to thresholds for landscape design and management (McIntyre *et al.* 2002).

Methods In the peri-urban study, 7 properties (16-200 ha) used for sub-commercial grazing, horticulture, or lifestyle (no farming activities) were surveyed. In the second study, 30 catchments (each 400-500 ha) were selected where commercial grazing was the major land use. All sites were in south-east Queensland. Assessments were made of a number of indicators (Table 1) representing components of resource condition (ecosystem function and biodiversity conservation) necessary for sustainable use (McIntyre *et al.* 2002). The methods are described in detail in MacLeod *et al.* (2004).

Results The peri-urban lands had less bare ground (more ground cover) than grazing lands (Table 1), a key requirement for minimising soil erosion. However, the peri-urban lands had more intensive land use along streams and more eroded or unstable stream banks. They had a greater proportion of sites with 30% of native woodland cover, considered a minimum threshold for wildlife habitat and maintaining biodiversity, but the sites were small (usually <5ha), the woodland was in poorer health and much of it lacked a range of tree age classes.

Table 1 Proportion of sites within peri-urban (PU) and commercial grazing (CG) areas meeting critical thresholds of key indicators.

Indicator	PU	CG
Less than 30% bare ground	88	63
Stream adjoined by intensive use	87	39
Stream bank extensively eroded or unstable	50	3
Greater than 30% native woodland	28	20
Woodland patches >5ha in area	9	82
Greater than 33% of trees with moderate to severe dieback	100	7
Three or more age classes of trees	18	65

Discussion Land use *per se* does not necessarily affect land condition; this is influenced by management and can be poor with either land use. While peri-urban landscapes could be expected to be in better ecological condition than commercial grazing lands (no commercial imperative for production, more resources, greater conservation philosophy of owners), these results indicate they can be in worse condition. While the better ground cover in peri-urban lands could be due to less grazing, the surveys were done in different years and the higher levels could be an artefact of seasonal conditions. Native woodland does occur widely on peri-urban areas, but much of this is more fragmented than on grazing lands, being intersected by roads, fence lines, buildings etc; reducing its effectiveness as wildlife habitat or as a corridor. Clearing, regrowth and re-planting on peri-urban land has led to woodlands with a limited number of age classes, and many trees in poor health. The poor tree health and limited age structure will reduce the ability of these areas to regenerate in the future. Adequate buffers along stream banks are considered essential to minimise stream bank erosion. However, most stream banks on peri-urban lands were adjoined by intensive use, and half of the stream banks were in poor condition compared to only 3% in the grazing lands. Improvements to land condition will require landscape scale management. In peri-urban areas opportunities for this may be limited due to the numerous owners involved, their multiple objectives, and the small scale at which land is currently managed.

References

- MacLeod, N.D., McIvor, J.G., McDonald, C.K., Hodgkinson, J.J. (2004). Land and Water Australia Project CSE7 Final Report. CSIRO, St Lucia.
- MacLeod, N.D. (2007). AgSIP Project AG14 Final Report. CSIRO, St Lucia.
- McIntyre, S., McIvor, J.G., Heard, K.M. (2002). Managing and Conserving Grassy Woodlands. CSIRO: Melbourne.