

The Ethnoecology of Landscape Burning around Kalumburu Aboriginal Community, North Kimberley Region, Western Australia:

an examination of the ecological and cultural significance of Aboriginal landscape burning in the North Kimberley using experimental, ethnographic and historical approaches.

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ABSTRACT

This thesis aims to characterise the burning practices of North Kimberley Aborigines, both pre-colonial and modern, and explore the ecological processes that surround these practices. This is achieved through a transdisciplinary approach (table 1). The study area was centred on the remote Aboriginal community of Kalumburu in the far North Kimberley and included surrounding lands. The scale of the research varies according to the approaches and the techniques employed. In some contexts the research was quite local but in other instances it included the whole North Kimberley and even the Kimberley region as a whole.

The thesis consists of a series of linked chapters covering the scope of the topic; however, each chapter stands alone with relevant introductory background material provided for each. For this reason some background material is repeated. The thesis begins by characterising Aboriginal landscape burning as it existed at the time of European colonization. First, chapter 2 uses historical analysis of the records of early European explorers to derive information on the broad spatial and temporal patterns of landscape fire in the 19th and early 20th centuries. Then chapter 3 uses ethnography to provide an indigenous perspective on landscape burning practices and patterns using oral accounts of senior traditional owners.

Next, the aim shifts to characterising contemporary fire patterns. Chapter 4 uses historical analysis and ethnographic accounts of Aboriginal people to describe contemporary fire use and changes in landscape fire patterns since colonization. And chapter 5 uses satellite remote sensing and ground-based survey methods to describe fire patterns in the landscape and to explore the relative influences of environmental factors and human land-use factors on these patterns.

Having established the contemporary patterns of landscape fire in the region, the ecological influences of different fire history variables on vegetation communities are explored. Chapter 6 investigates the impact of a ten-year fire history (based on satellite data) on the structure and floristic composition of woody vegetation in three broad dominant plant communities using a landscape-scale natural experiment. The impact of individual fire events on the flowering success of dominant 'bushtucker' trees (trees with edible fruit used by Aboriginal people) is then examined in chapter 7, also using natural experiments.

Chapter 8 provides a conclusion by drawing together the significant outcomes of the research presented in each chapter and explores a number of the political and social implications related to landscape fire in the region.

Access restrictions apply to some components of this thesis that contain Aboriginal cultural knowledge (particularly chapter 3) however, much of the non-restricted material has been published, as listed in Table 1.

Table 1 Thesis outline showing the 2 major questions addressed in the thesis and the aims, methods and spatial and temporal scales employed in each chapter to answer these questions.

| Question 1 | <i>What is the nature of Aboriginal landscape burning in the North Kimberley, in both contemporary and pre-colonial contexts?</i> | | | | |
|------------|---|--|-------------------------------------|------------------------|--|
| Question 2 | <i>What are the ecological implications of Aboriginal landscape burning practices in the North Kimberley, in both contemporary and pre-colonial contexts?</i> | | | | |
| Ch | Aims | Method | Spatial scale | Temporal scale | Publications |
| 1 | Introduction. | Descriptive | | | |
| 2 | Characterise Aboriginal landscape burning with a pre-European emphasis. | Historic analysis | Kimberley | 1688-1954 | Vigilante T (2001) Analysis of explorers' records of Aboriginal landscape burning in the Kimberley region of Western Australia. <i>Australian Geographical Studies</i> 39 (2): 135-155. |
| 3 | | Ethnography | North Kimberley | Pre-colonial | |
| 4 | Characterise contemporary Aboriginal landscape burning. | Historic analysis Ethnography Analytic | Kimberley North Kimberley | 1880s to 2002 | Vigilante T, Bowman DMJS, Fisher R, Russell-Smith J, Yates C (2004) Contemporary landscape burning patterns in the far North Kimberley region: human influences and environmental determinants. <i>Journal of Biogeography</i> 31 (8): 1317-1333. |
| 5 | Characterise spatial and temporal patterns of contemporary landscape fire and determine the relative influence of human and natural factors. | Remote sensing Ground-based survey | Landsat image 60 km ² | 1990-1999 1999-2000 | Fisher R, Vigilante T, Yates C, Russell-Smith J (2004) Patterns of landscape fire and predicted vegetation response in the North Kimberley region of Western Australia. <i>International Journal of Wildland Fire</i> 12 (4): 369-379. |
| 6 | Investigate the influence of fire history factors on woody vegetation. | Landscape-scale Natural experiment Vegetation survey Remote sensing | 1000 km ² | 1990-2001 | Vigilante T, Bowman DMJS (2004a) Effects of fire history on the structure and floristic composition of woody vegetation around Kalumburu, North Kimberley: a landscape-scale natural experiment. <i>Australian Journal of Botany</i> 52 (3): 381-404. |
| 7 | Investigate the influence of individual fire events on flowering and fruiting of midstorey tree species. | Landscape-scale Natural experiment Vegetation survey | 60 km ² | 1999-2001 | Vigilante T, Bowman DMJS (2004b) Effects of individual fire events on the flower production of fruit-bearing woody tree species at Kalumburu, North Kimberley. <i>Australian Journal of Botany</i> 52 (3): 405-416. |
| 8 | Conclusion. | | | | |