

A course developed by ...



RANGELANDS AUSTRALIA

ADVANCED RANGELAND ECOLOGY

Postgraduate Course – AGRC7035

Available Semester 2

In External, Internal or Intensive Mode
(Subject to minimum numbers)

OVERVIEW

Rangeland management is inextricably linked to ecology. **Rangeland ecology** encompasses the foundational knowledge for grazing land management. It involves the study of the relationships and interactions of the biological/ecological and physical components in a rangeland ecosystem. This includes the important interactions of climate/landform/soils/vegetation/plants/soils/animals in a particular environment.

Applied ecology is the basis for successful rangeland management. Grazing land management requires that inputs be minimised and used as effectively as possible. This is partly dictated by the relatively low profit margins per unit area. Temporal and spatial variability over the rangelands as well as the grazing habits of domestic, native and feral herbivores require managers to focus on using ecological processes to achieve objectives. As a generalisation, the maintenance and improvement of grazing lands reflects more the ability of management to work with ecological processes than the efficacy of a particular technology.

A sound ecological knowledge is essential for those who are involved in any aspect of rangeland management, particularly for the decision-making which is directly related to livestock, wildlife or the natural resources.

This course includes the theoretical background, principles and concepts of rangeland ecology. Coverage of ecosystem components and how they function in ecological models provides important understanding. Grazing processes of herbivores and the ecological basis of fire are a focus of the course. Ecological aspects of land degradation and reclamation as well as weed invasion and management are also covered. Measurement of the functioning of an ecosystem in the field provides the opportunity to demonstrate ecological understanding at a practical level. While much of the material relates to Australian rangelands, a substantial proportion has universal application. The material presented will serve as a framework on which ongoing knowledge and understanding can be built, and on which developing practices can be analysed and critically reviewed.

LEARNING OBJECTIVES

After successfully completing this course you should be able to:

- Describe and discuss the main rangeland types in the world and particularly in Australia, together with their ecological characteristics and significance.
- Describe, discuss and apply the current knowledge of concepts, principles and models which have been developed to enhance understanding of rangeland ecology.
- Describe, discuss and apply the ecological processes which occur in rangeland ecosystems – from functional to dysfunctional.
- Describe, discuss and apply the principles of ecology of weeds in rangeland ecosystems.

- Describe, discuss and apply the principles of the ecology of land degradation and reclamation of rangelands.
- Describe, discuss and apply rangeland ecology to rangeland management.

COURSE STRUCTURE

Course modules include:

- Introduction to advanced rangeland ecology
- The rangeland environment and ecosystems
- Ecological processes
- Ecology of weeds in rangelands
- Ecology of degradation and reclamation in rangelands
- Application of ecology to rangeland management

LEARNING FACILITATOR

Bruce Alchin (BScAgr, MSc, GCEd). Bruce has had over 30 years experience in the rangelands of Australia. This includes 20 years with the NSW Soil Conservation Service and Western Lands Commission (WLC) in western NSW. He was involved in land resource mapping, property management planning, research and advisory work. Time with the WLC also provided experience with land administration and politics. Bruce was a Churchill Fellow studying rangelands in the USA in 1984. Since 1988, he has been based in Qld, and involved in rangelands teaching, research (particularly on grazing management) and consultancies. Whilst having broad experience, much of Bruce's work has been 'hands-on' at the property and paddock level. Overseas work has been in the USA and Indonesia.

REQUIRED TEXT BOOKS

There are two text books required for this course.

Ludwig et al (1997) 'Landscape Ecology: Function and management. Principles from Australia's rangelands.' CSIRO Publishing, Melbourne.

Tongway, D. & Hindley, N. (2004) 'Landscape Function Analysis Manual'. CSIRO.

In addition there have been two publications supplied free of charge by the Australian Government's Department of Environment and Heritage, viz:

'Fire management: Managing for biodiversity in the rangelands'

'Weed management: Managing for biodiversity in the rangelands'

ASSESSMENT

There are no 'examinations', just three (3) assessment items for this course.

Assessment 1: Online discussion activities - 20%

Throughout the course you will be required to complete a number of learning activities online. These will involve reacting to course materials, and reading and responding to the postings of other students and the Learning facilitator.

Assessment 2: Ecology of a particular rangeland type of interest to the student – 40%

Collate and interpret the ecological knowledge about this type, identify gaps in knowledge and research to address the gaps, and discuss how the available knowledge can be used to improve ecological sustainability.

Assessment 3: Landscape Function Analysis (LFA) of a particular rangeland type - 40%

Apply the LFA method, interpret the data, and make recommendations for reclamation of degraded areas and further ecological research.

BACKGROUND TO THIS COURSE

The need for this course was confirmed by a national survey of education and skills needs for success in the rangelands. This course was originally offered as an individually-guided study, and has now been converted to a generalized structure suitable for delivery by distance.

COURSE EVALUATIONS

Students completing this course in 2006 and 2007 were asked to evaluate the relevance, practicality and quality of the course and its delivery (on 1-5 scale, with 1=strongly disagree and 5=strongly agree). The following average ratings were received:

- | | |
|--|---------|
| • Clear and relevant learning objectives | 5.0/5.0 |
| • Satisfied with the course content | 4.5/5.0 |
| • Satisfied with the amount of contact with the Learning facilitator | 5.0/5.0 |
| • I gained new skills and knowledge | 5.0/5.0 |
| • Learning and assessment activities challenged me to think | 5.0/5.0 |
| • Course is well structured and components well integrated | 5.0/5.0 |
| • Course is relevant to my workplace/business | 5.0/5.0 |
| • Course is relevant to my future in the rangelands | 5.0/5.0 |
| • Overall, I'm satisfied with this course | 5.0/5.0 |

Students have also provided the following general comments on this course:

- *"Reinforcement of the importance of appropriate management combined with regular review."*
- *"Direct application to my enterprise. Useful tools for point-in-time and ongoing assessment of rangeland condition."*