Monitoring biodiversity in jarrah forest managed for timber harvesting

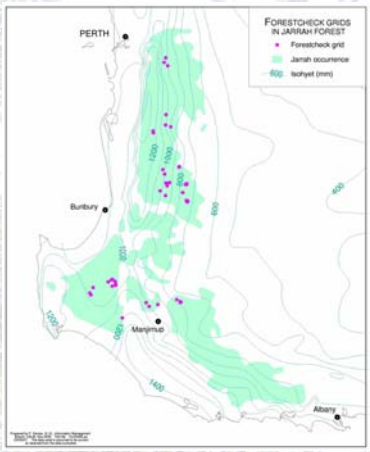
Richard Robinson

Science Division, Department of Environment and Conservation, Manjimup, WA 6258

Email: Richard.Robinson@dec.wa.gov.au

Introduction

Under conditions of uncertainty and change, monitoring forms the basis for adaptive management. Integrated monitoring is a fundamental component of Ecologically Sustainable Forest Management (ESFM), and is necessary for reporting against the Montreal Process criteria and indicators for ESFM. FORESTCHECK is an integrated monitoring system developed to provide information to forest managers in the southwest of Western Australia about changes and trends in key elements of forest biodiversity associated with management activities. FORESTCHECK also meets a range of compliance conditions placed on the Forest Management Plan 1994-2003 through Ministerial Conditions and the Codd Report of 1999. The initial focus of FORESTCHECK is on timber harvesting and silvicultural treatments in jarrah (*Eucalyptus marginata*) forest and is included as an operational program in the current Forest Management Plan 2004-2013.



Location of FORESTCHECK grids

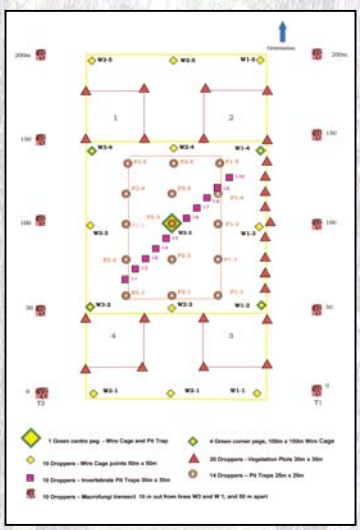
Development of FORESTCHECK

The Science Division of the Department of Environment and Conservation (DEC) has primary responsibility for the implementation of FORESTCHECK. The program was developed over 2 yrs with input from scientists and managers within DEC, and from universities and other government agencies. FORESTCHECK was initiated in 2002. The Concept Plan and Operations Plan may be viewed on the DEC Naturebase website at: http://www.naturebase.net/science/science.html

Forest structure, soils, litter and coarse woody debris

Reporting

Annual Reports that include details of grid establishment, site details, and preliminary findings from basic data analysis are produced each year. A major peer reviewed report and analysis is to be undertaken and published at 5-year intervals. Annual Reports are posted on the DEC Naturebase web site at: http://www.naturebase.net/science/science.html



Layout of monitoring points and transects on each grid

Methods

A total of 48 monitoring grids have been established at 5 locations throughout the southwest (*above*). One location is monitored each year.

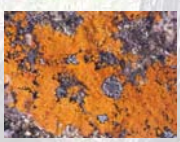
- 8-12 monitoring grids at each location
- long-uncut including old growth forest (external controls)
- coupe buffers (internal controls)
- shelterwood and/or selection cut treatment
- gap release treatment

Locations are stratified according to recognised ecological gradients of rainfall, evapo-transpiration and soil fertility and grids are matched according to vegetation complex. Each 2 ha grid (*left*) is assessed for attributes such as forest structure, soil condition and levels of litter and coarse woody debris (*far left*), as well as elements of biodiversity including vascular flora, vertebrate fauna (birds, mammals and reptiles), cryptogams (lichens, liverworts and moss), macrofungi and invertebrate fauna (*below*). Sampling protocols are described in the Operations Plan.

Reptiles

Fungi

Invertebrates



Lichens

Mammals

Birds

Flora

Staff and Funding Verna Tunsell (data management), Lachie McCaw & John Neal (forest structure, foliar and soil nutrients), Kim Whitford (soils), Richard Robinson & Bob Smith (Macrofungi, CWD and Litter), Janet Farr, Alan Wills & Paul van Heurck (Invertebrate fauna), Graeme Liddelow (vertebrate fauna), Ray Cranfield (cryptogams, vascular flora), Bruce Ward (vascular flora), Ian Abbott & Neil Burrows (scientific advice), Amanda Mellican (data management, data analysis), Matthew Williams (data analysis) & Glenda Lindsey (administration). Each year several casual staff and volunteers work on the team as well as a number of local DEC district staff who help with plot installation and vertebrate trapping.

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