FOREST CHECK

DEPARTMENT OF Conservation AND LAND MANAGEMENT

Monitoring Biodiversity in Jarrah Forest

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Monitoring Biodiversity in Jarrah Forest

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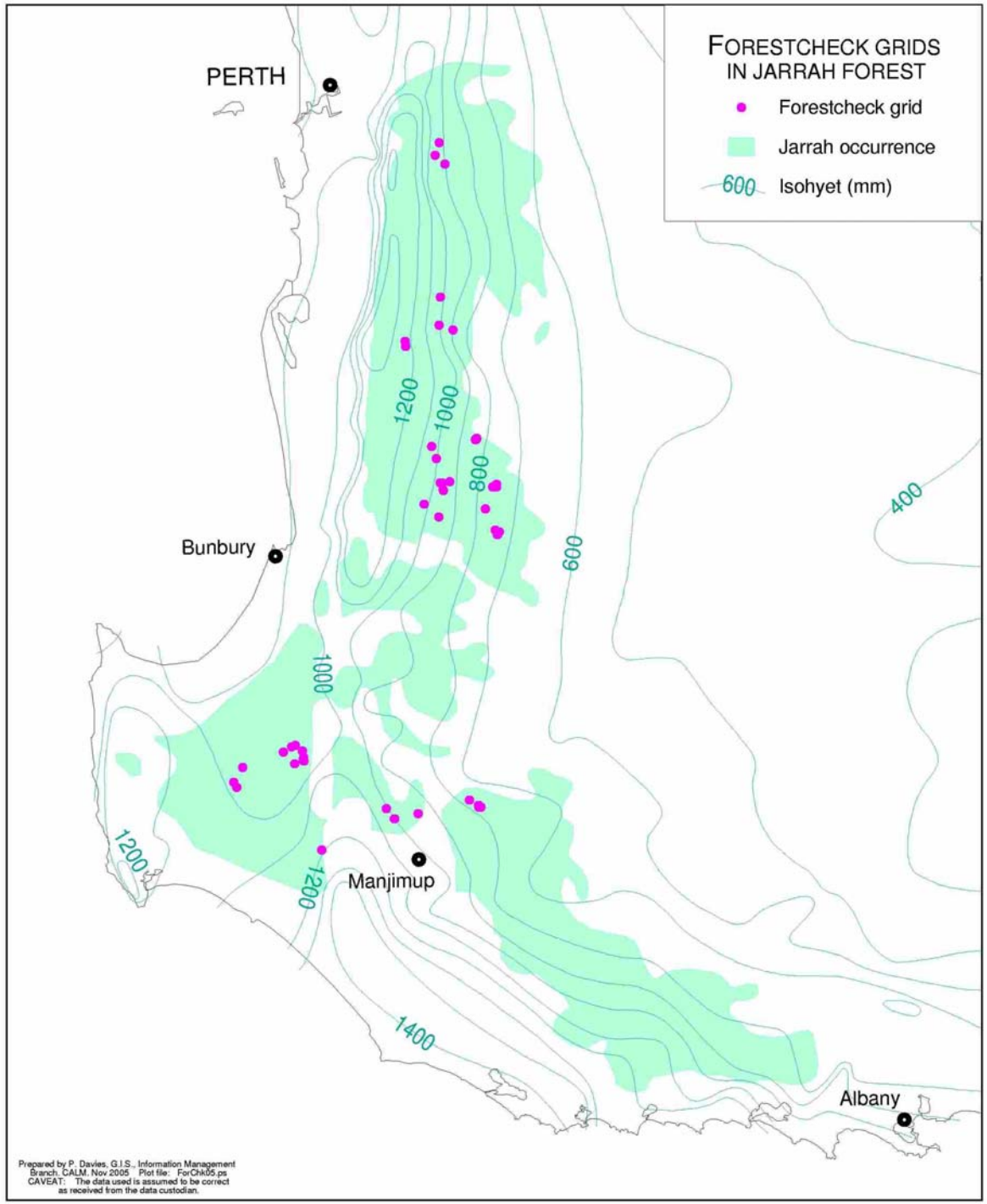
- Integrated system to monitor changes and trends in key elements of forest biodiversity associated with forest management activities
- Developed to comply with:
    - Conditions placed in Forest Management Plan 1999-2003 through Ministerial conditions and Codd Report (1999)
    - Reporting on ESFM against Montreal Process Criteria
- Focus (at present) on timber harvesting in jarrah forest
- Included as an Operational Program in current Forest Management Plan 2004-13

Initiated in 2001

5 locations within the range of jarrah forest

Total of 48 monitoring grids established over 5 years

- **2001 – Southern Jarrah (Donnelly, 10 grids)**
- **2002 – Central jarrah (Wellington, 9 grids)**
- **2003 – Northern Jarrah (Perth Hills, 8 grids)**
- **2004 – Eastern Jarrah (Wellington East, 10 grids)**
- **2005 – Sunklands (Blackwood Plateau, 11 grids)**



Monitoring Biodiversity in Jarrah Forest

Program initiated in 2001

- Treatments at each location are:
  - External control (unlogged), TEAS (buffer) where available
  - Shelterwood (and/or Selective cut)
  - Gap Release
- 1 location monitored annually
- Annual analysis and report
  - http://www.naturebase.net/science/science.html
- Major analysis every 5 years (due in 2006)


External Control – Virgin Forest


Selective Cut


Shelterwood


Gap Release

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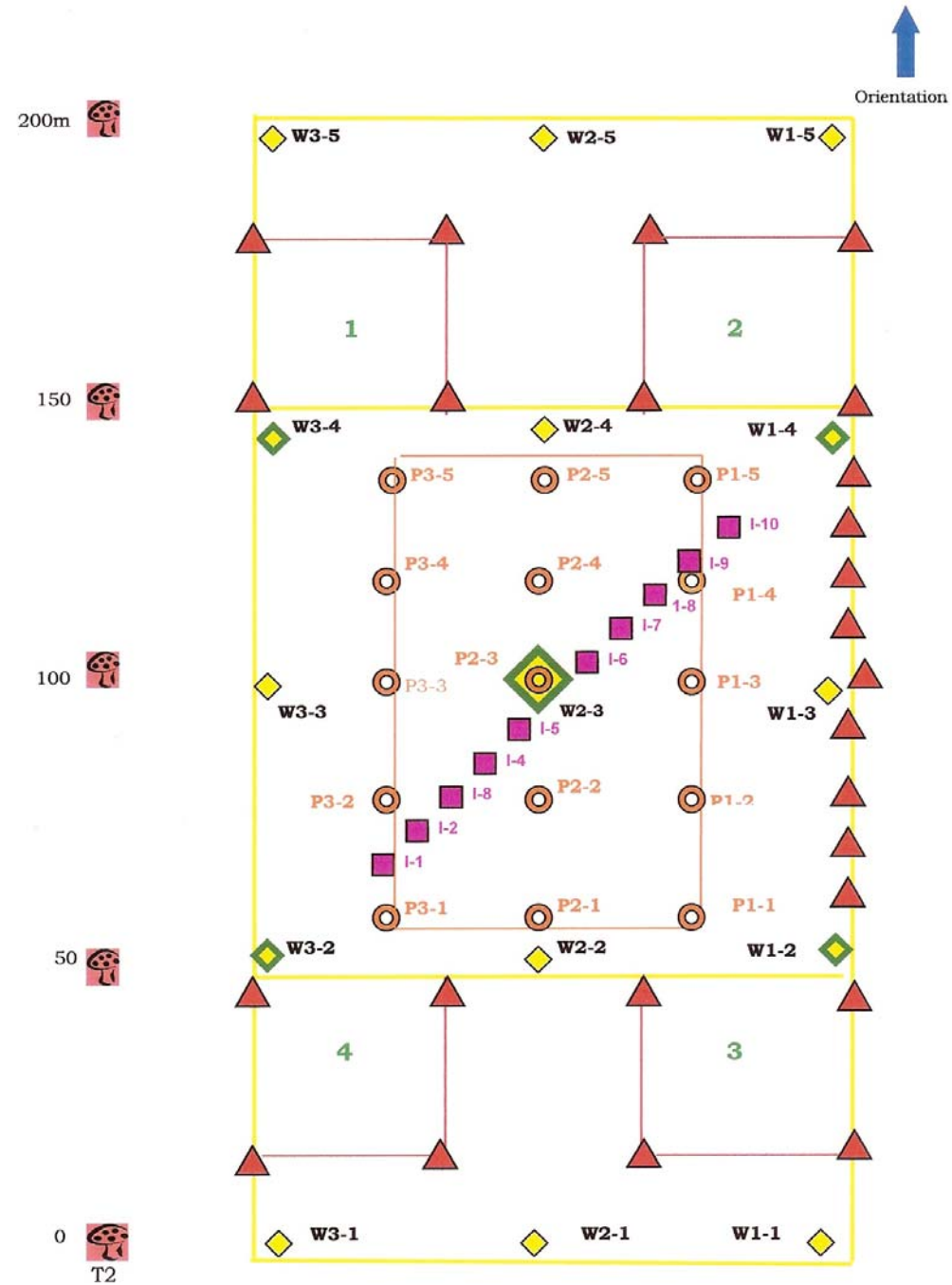
Monitoring grid



Grid/Plot Centre – overall grid size 100m x 200m

Corner pegs for main plot – 100m x 100m

Wire cage x15

Small vertebrate pit traps x15

Macrofungi transect 2 x 200m

Invertebrate pit traps x10

Vegetation plots 4 x 30x30m

Cryptogams

Forest structure and regeneration

Soil nutrients

Soil disturbance

Forest Attributes Monitored - Objectives

Forest Structure and Regeneration

- To describe the stand structure, species composition and developmental stage of tree species present on each sampling grid
- To quantify the basal area removed in past harvesting events, and
- To measure the contribution of mid-storey species to stand structure, density and basal area

Foliar and Soil Nutrients

- To provide information on the nutritional status of the forest on each sampling grid

Forest Attributes Monitored - Objectives

Soil Disturbance

- To record the extent of machine soil disturbance (snig tracks) where it can be readily identified
- To monitor the intensity of changes to soil physical properties induced by logging, and to monitor further change over time
    - Intensity of disturbance measured as the fine earth bulk density of the soil

Coarse Woody Debris and Litter (Transects and Plots)

- Measure and record amounts on each sample grid

Forest Attributes Monitored - Objectives

Macrofungi (Transects)

- Record species richness and abundance on each sample grid
- Analyse trends within functional groups (eg. decomposers, mycorrhizal etc) and between treatments
- Generate detailed descriptions of unknown and unnamed species

Cryptogams (lichens, mosses and liverworts) (Transects)

- Record species richness and abundance on each sample grid
- Record species habitat and substrate preference
- Analyse trends between treatments

Forest Attributes Monitored - Objectives

Vascular Plants (Plots)

- Record species richness and abundance on each sample grid
- Determine species composition and vegetation structure for each treatment

Invertebrates (Pitfall traps, light traps, foliage beating)

- Record species richness and abundance in each sample grid
- Determine species composition for each treatment
- Monitor presence of Gondwanan relics
- Monitor pest species

Forest Attributes Monitored - Objectives

Birds (diurnal – sight and sound surveys, nocturnal – spotlight transects)

- Record species richness and abundance on each sample grid

Mammals and Herpatofauna (wire traps and pit traps)

- Record species richness and abundance on each sample grid
    - Determine sex ratios
- Record presence of ferals (sandpads, spotlighting)
- Record nocturnal species (spotlighting)

Forest Attributes Monitored - Objectives

Data Management and Analysis

- All data entered and managed centrally
- Comparisons between treatments (Control (Unlogged), Shetterwood and Gap release) and locations for
    - species richness, abundance and composition of all monitored flora and fauna
    - stand structure, regeneration and nutrient
    - CWD and litter loads
    - soil fine bulk densities and snig track area

Fire

All grids are included in the prescribed fire schedule

In the case of wildfire or unplanned fire:

- Grids are not specifically protected, but
- machine activity associated with fire-suppression is excluded from grids

Extra monitoring carried out following unscheduled fire;

eg. Perth Hills wildfire, January 2005 gave the rare opportunity to undertake monitoring following a fire of severe intensity when one of the External Control plots (previously unburnt for 20 years) was burnt


External Control – 20 years unburnt


External Control – following 2005 wildfire

Task/Activity	$ Budget	
OPERATIONAL		
Grid establishment	10 000	
Forest structure and regeneration	6 000	
Soil and foliar nutrients	5 000	
Soils disturbance	10 000	
Macrofungi / Litter & CWD	7 000	
Vascular flora	5 000	
Cryptogams	5 000	
Invertebrates	13 000	
Birds (diurnal)	4 000	
Birds (nocturnal)	5 000	
Fauna (grid trapping)	4 000	
Spotlight Road surveys (vertebrate.)	4 000	
OTHER		
Administration and overheads	63 882	
Data base management	46 796	
Directorate	11 321	
SUB TOTAL	**200 000**	
SALARY	173 437	
TOTAL	**373 437**	

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Budget 2004-05

4 Research staff

8 Technical staff

2 Data management

+ Various Casual & Salaried staff

- grid establishment
- trapping