

Sustainable Forest Management for Water, Biodiversity and Other Values

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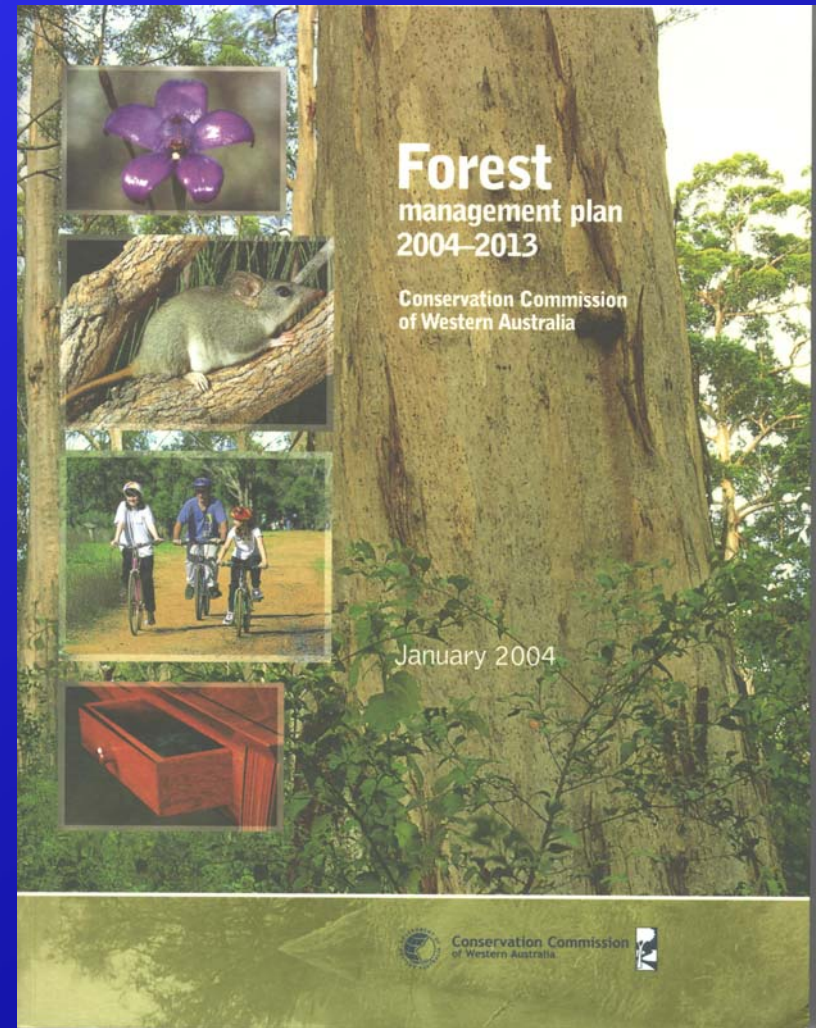
Department of Environment and Conservation

Sustainable Forest Management for Water, Biodiversity and Other Values

1. Strategies for Sustainable Forest Management
2. DEC's research program relevant to Wungong
3. Future research directions
4. Risks and uncertainties associated with the Wungong project
5. Gaps in the Wungong research and monitoring program
6. Opportunities for collaboration
7. DEC's roles and responsibilities

1. Strategies for Sustainable Forest Management

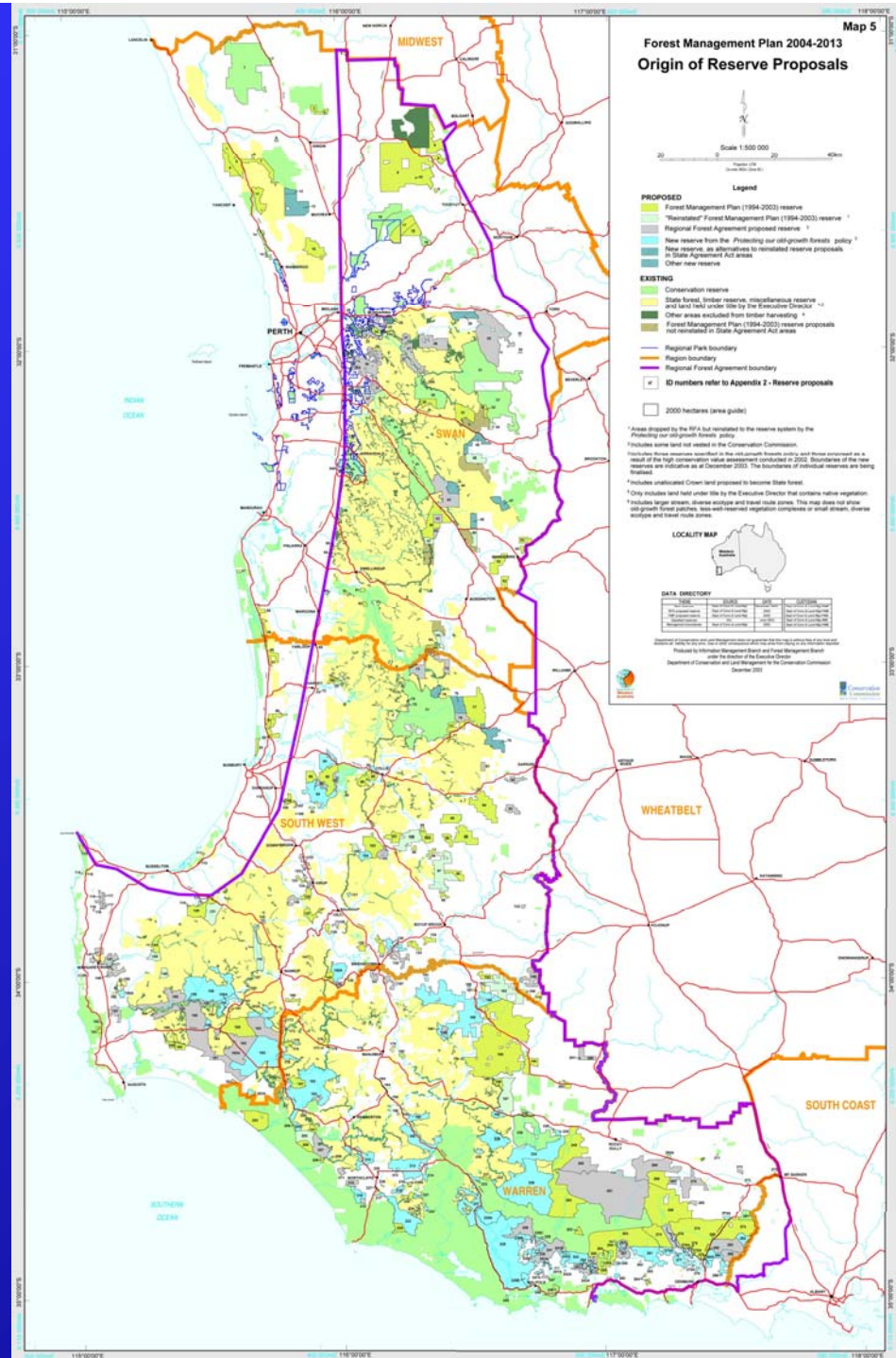
- The Forest Management Plan 2004-2013 is the key document that sets strategies for sustainable forest management



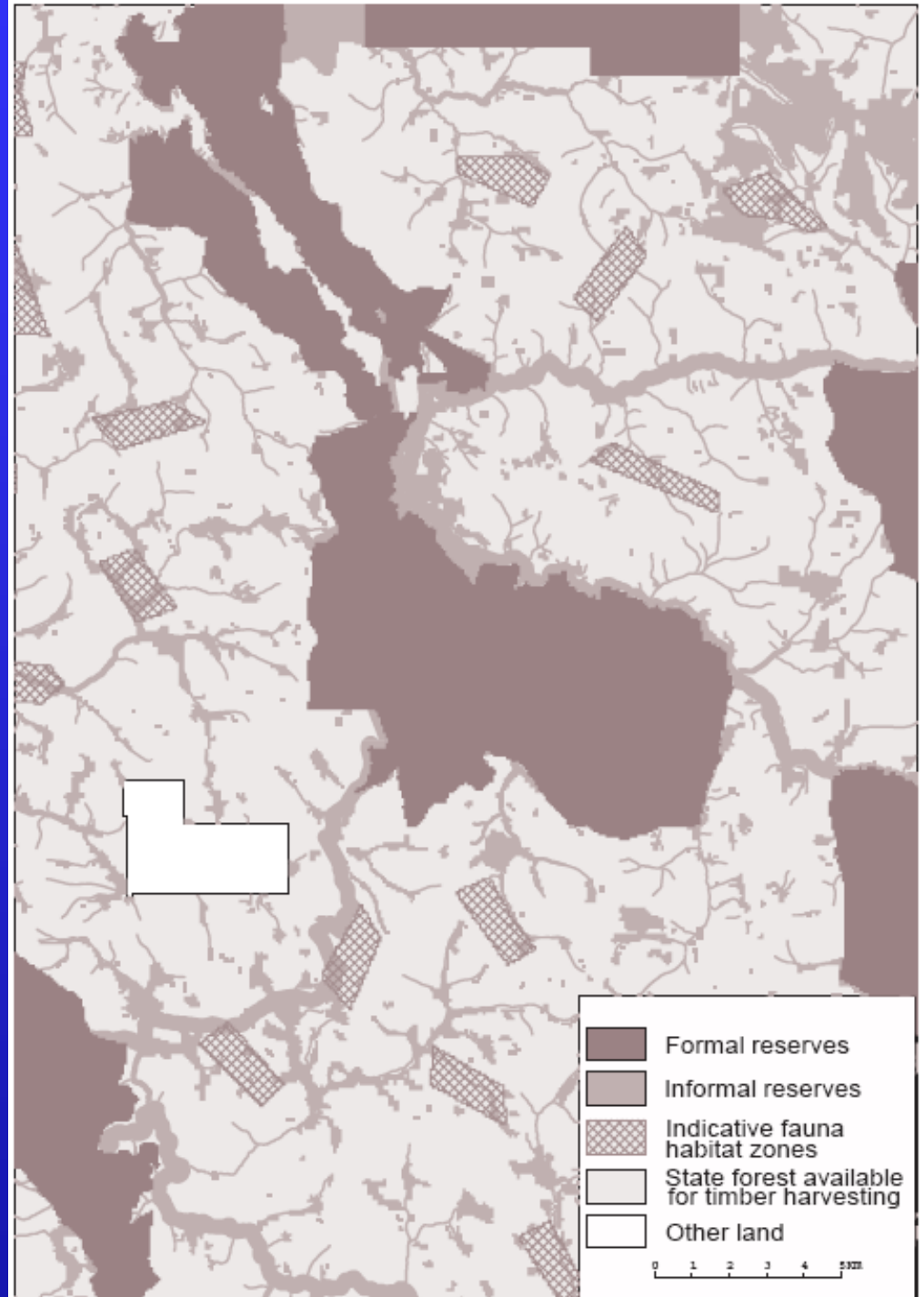
1. Strategies for Sustainable Forest Management

- Some of the key strategies for biodiversity conservation are:
 - Formal conservation reserves
 - Informal reserves system
 - Fauna habitat zones
 - Silvicultural guidelines that prescribe limits on gap size, minimum tree density to retain, retention of habitat trees, protection of understorey and mid-storey elements

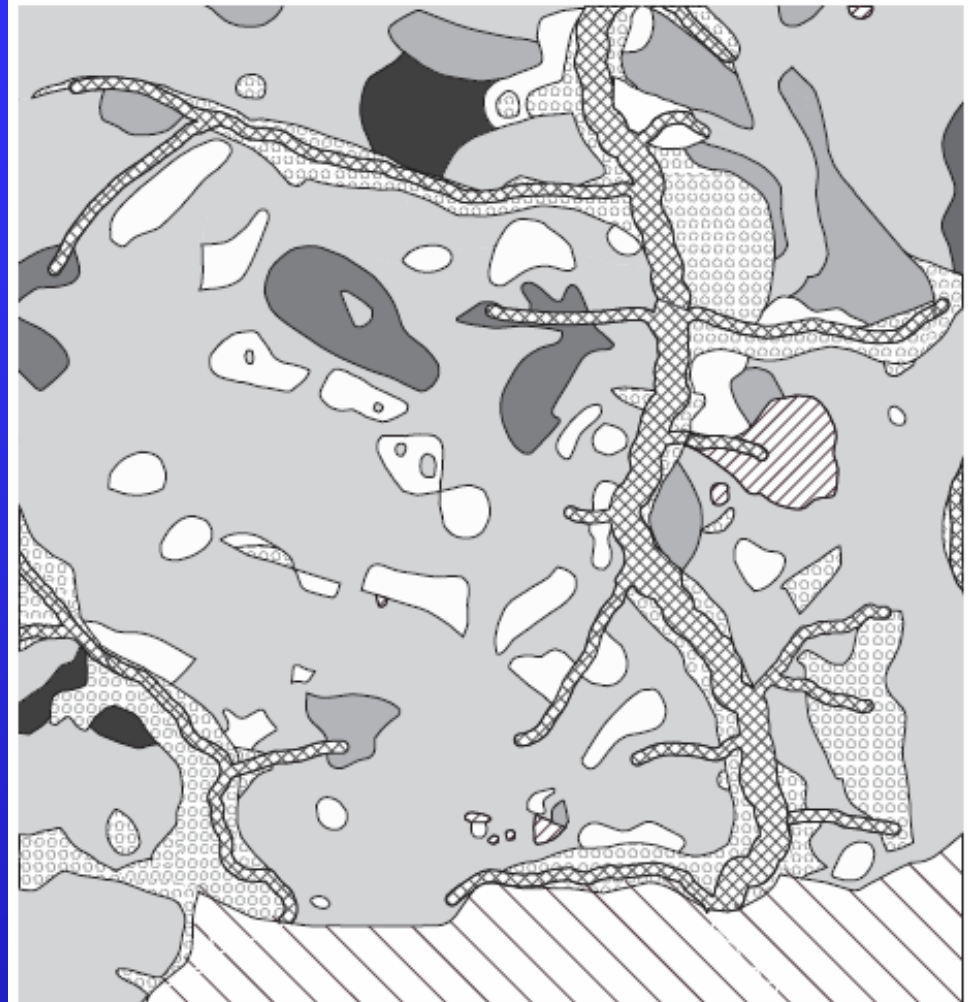
- 40% of DEC land is formal conservation reserve
- 22% of original jarrah forest reserved
- 39% of original karri forest reserved
- 19% of original wandoo forest reserved



- 8.5% of State forest is informal reserve
- 5% of State forest is Fauna Habitat Zone



- At the stand scale there is a mosaic of different types of cutting
- There are a range of types of areas excluded from harvesting



0 1000 2000 Metres

AREAS EXCLUDED FROM TIMBER HARVESTING

- Existing formal reserves
- Stream zone areas
- Other unharvested forest
- Diverse ecotype zones

TYPES OF CUTTING

- Gap with retained habitat
- Thin with retained habitat
- Shelterwood with retained habitat
- Selective with retained habitat
- Mixed mosaic of cutting types

1. Strategies for Sustainable Forest Management

- Some of the key strategies for water conservation are:
 - Informal reserves around all streams and rivers



1. Strategies for Sustainable Forest Management

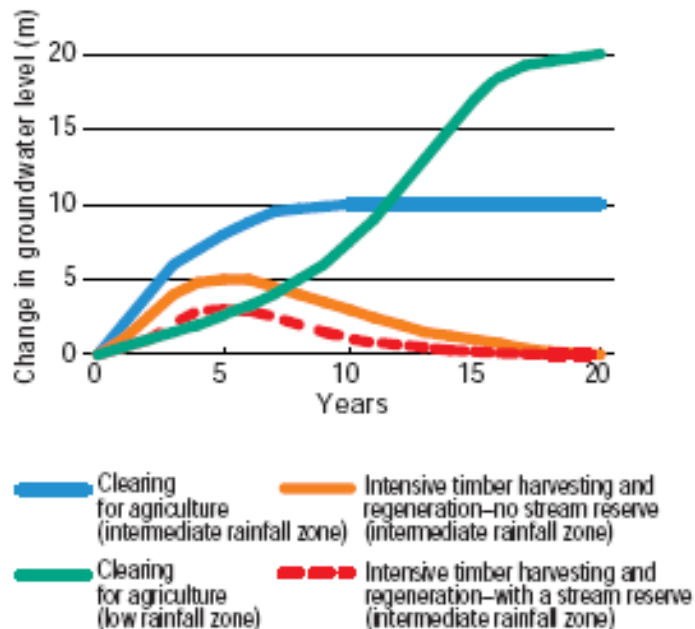
- Some of the key strategies for water conservation are:
 - **Maintain roads and close roads where possible**



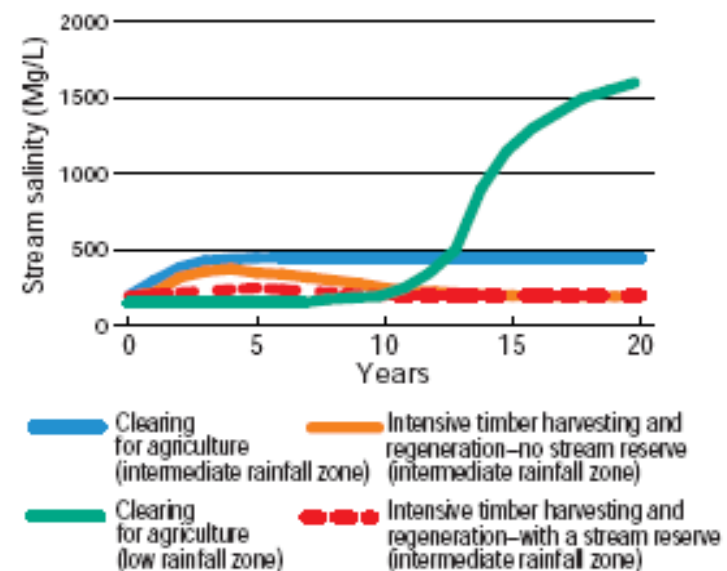
1. Strategies for Sustainable Forest Management

- Some of the key strategies for water conservation are:
 - **Silviculture designed to minimise risk of stream salinity**

Generalised changes in groundwater level



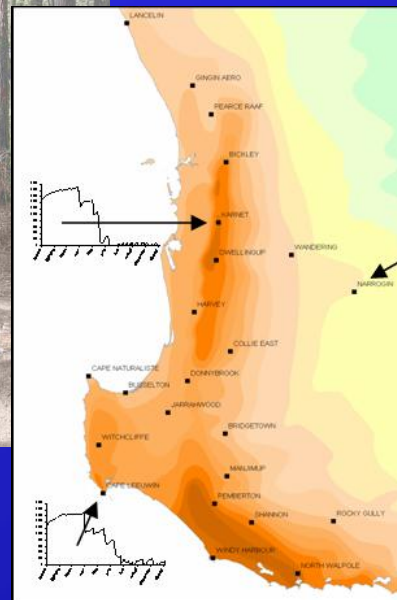
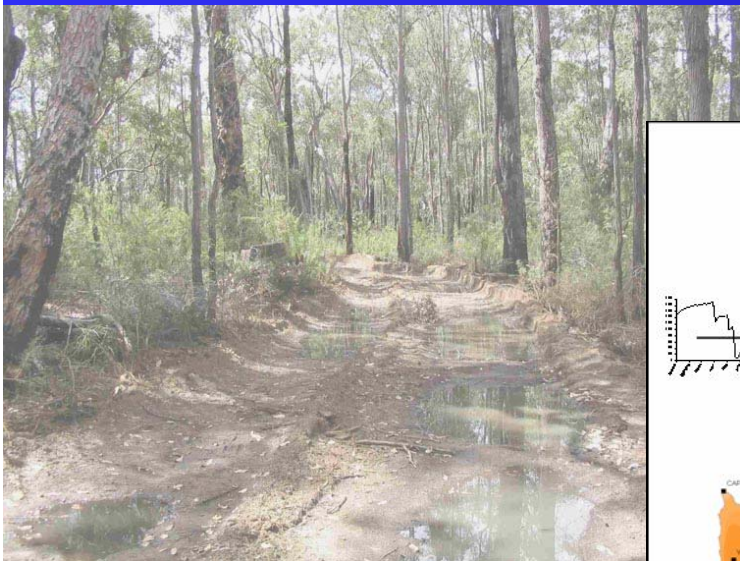
Generalised changes in stream salinity



Sustainable Forest Management for Water, Biodiversity and Other Values

1. Strategies for Sustainable Forest Management

- Some of the key strategies for water conservation are:
 - Soil protection measures aimed to minimise unnecessary soil disturbance



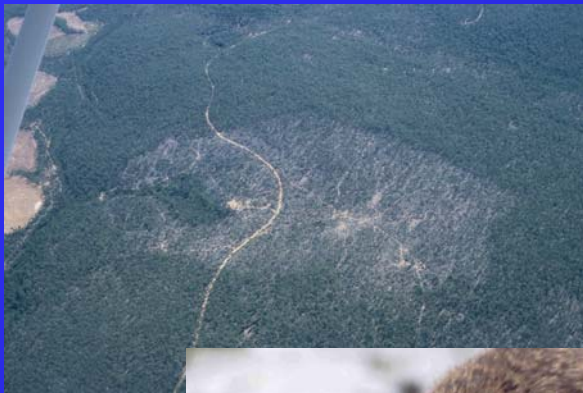
Most recent values of the Trafficability Index ²⁰¹¹

NB: In the table below, **transition status** is valid up to 'date of last TI update', and for transitional compartments the value in brackets represents the total rainfall in mm since entering the transitional period. **24-hr rain** gives the total rainfall in mm recorded in the 24 hours prior to 9:00 am, 01-Jun-2005 (nulls occur for compartments where weather data are not yet available - check 'date of last TI update').

Compartment	date of last TI update	TI	risk period	transition status	24-hr rain	weather station used
ABBA_01	01-Jun-2005	267	medium	trans (13.8)	0.0	JARRAHWOOD
ABBA_02	01-Jun-2005	267	medium	trans (13.8)	0.0	JARRAHWOOD
ABBA_04	01-Jun-2005	267	medium	trans (13.8)	0.0	JARRAHWOOD
ANDREW_01	01-Jun-2005	240	medium	trans (30.5)	0.2	PEMBERTON
ARGYLE_02	01-Jun-2005	273	medium	trans (22.0)	0.0	DONNYBROOK
AWS_ALBANY AIRPORT	01-Jun-2005	228	medium/high	post	0.0	ALBANY AIRPORT
AWS_BICKLEY	01-Jun-2005	216	medium	trans (31.0)	0.0	BICKLEY
AWS_BRIDGETOWN	01-Jun-2005	251	medium	trans (43.7)	0.0	BRIDGETOWN
AWS_BUSSELTON	01-Jun-2005	298	medium	trans (5.8)	0.0	BUSSELTON
AWS_CAPE LEEUWIN	01-Jun-2005	795	low	pre	0.0	CAPE LEEUWIN
AWS_CAPE NATURALISTE	01-Jun-2005	781	low	pre	0.0	CAPE NATURALISTE
AWS_COLLIE EAST	01-Jun-2005	262	medium	trans (43.0)	0.0	COLLIE EAST
AWS_DONNYBROOK	01-Jun-2005	272	medium	trans (32.8)	0.0	DONNYBROOK
AWS_DWELLINGUP	01-Jun-2005	210	medium/high	post	0.0	DWELLINGUP
AWS_GINGIN AERO	01-Jun-2005	987	low	pre	0.0	GINGIN AERO
AWS_HARVEY	01-Jun-2005	262	medium	post	0.0	HARVEY
AWS_JARRAHWOOD	01-Jun-2005	265	medium	trans (29.1)	0.0	JARRAHWOOD

2. DEC's research program relevant to Wungong

- Investment in research via DEC Science Division
- > M \$3.1 per year



2. DEC's research program relevant to Wungong

- Themes:
 - Effects of timber harvesting on flora, fauna, soil and water
 - Fire management
 - Forest health (pests, diseases, abiotic agents)
 - Silviculture and stand dynamics
 - Monitoring and survey
 - Forest fauna (quokka, ring tail possum, woylie, karri birds)

2. DEC's research program relevant to Wungong

- Themes:
 - Predator control
 - Dieback control & management
 - Biological survey
 - Herbarium (taxonomy, curation, Florabase)
 - Rare flora conservation
 - Weeds ecology & management
 - Wetland monitoring

2. DEC's research program relevant to Wungong

- Focus on jarrah and karri forest
- ARC linkage projects in wandoo and tuart forest
- Bushfire CRC project on fire regimes in southern forest landscapes

2. DEC's research program relevant to Wungong

- FORESTCHECK integrated monitoring
- Monitoring stream biodiversity-KPI 20 for FMP 2004-13) (1 sample site in Wungong)
- Landscape / fire interactions and invertebrate biodiversity in northern jarrah (Helena & Serpentine catchments)

2. DEC's research program relevant to Wungong

- Streamflow and groundwater response to timber harvesting in the intermediate rainfall zone
- Effect of fire regimes on jarrah understorey (>20 years data from replicated plots)
- Kingston study – response of vertebrate and invertebrate to harvesting and fire

3. Future research directions

- Silvicultural treatment in dieback-affected forest (overstorey, understorey, fauna)
- Forest health monitoring of biotic and abiotic agents
- Jarrah seedling establishment and seed crop forecasting

4. Risks and uncertainties associated with the Wungong project

- Biodiversity
 - Herbicides and understorey
 - Shorter return period for disturbance operations
 - General monitoring
 - Targeted monitoring of high risk groups

4. Risks and uncertainties associated with the Wungong project

- Productive capacity
 - Impacts of management options on future wood flows
 - Tree growth in rehabilitation areas

4. Risks and uncertainties associated with the Wungong project

- Health and vitality
 - Future silviculture of dieback infested forest
 - Response of weeds to disturbance
 - Techniques to reduce weeds associated with rehabilitation areas

4. Risks and uncertainties associated with the Wungong project

- Soil and water
 - Streamflow quantity
 - Water balance modeling
 - Soil disturbance in bauxite pits

4. Risks and uncertainties associated with the Wungong project

- Socio-economic
 - Aesthetic impacts
 - Social acceptance
 - Optimising water and wood values

4. Risks and uncertainties associated with the Wungong project

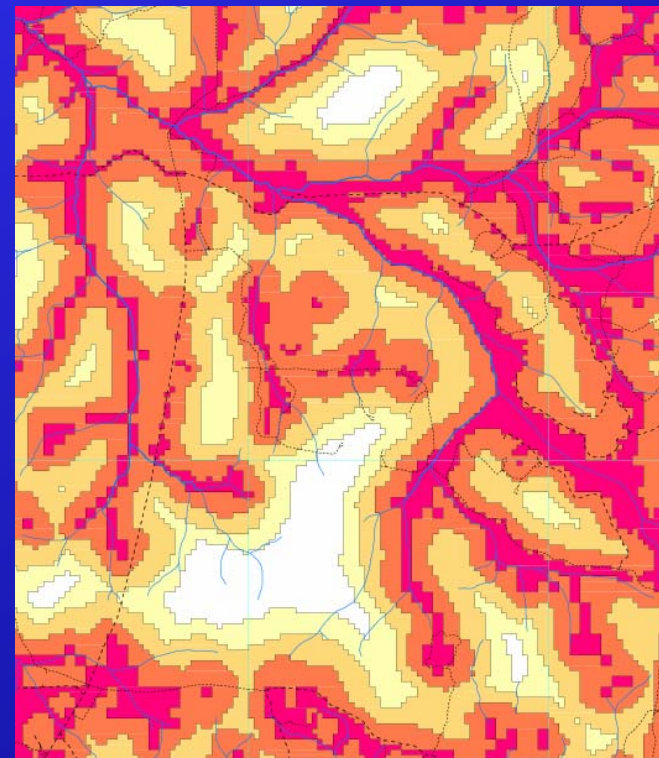
- Adaptive management
 - Testing a range of thinning options




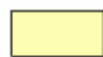
5. Gaps (?) in the research and monitoring program

- Targeted biodiversity monitoring of high risk groups
- Tree growth in rehabilitation areas
- Future silviculture of dieback infested forest
- Techniques to reduce weeds associated with rehabilitation areas
- Impacts of management options on future wood flows
- Optimising water and wood values

6. Opportunities for collaboration

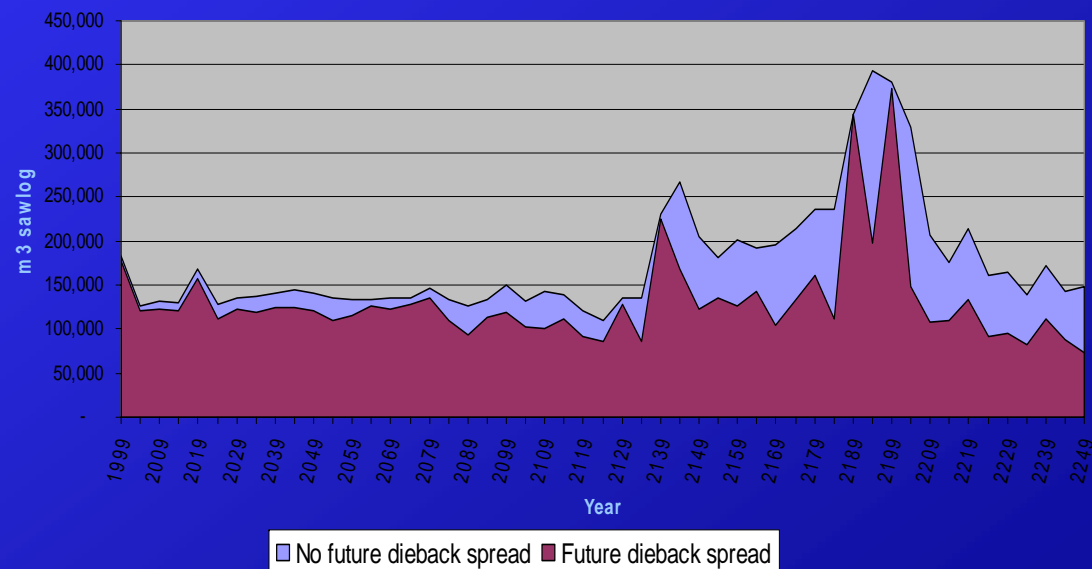
- Future silviculture of dieback infested forest



LEGEND	
	2001
	2061
	2121
	2181

6. Opportunities for collaboration

- Impacts of management options on future wood flows
- Optimising water and wood values



7. DEC's roles and responsibilities

- Consistency of the project with the Forest Management Plan
- Approval of guidelines for silvicultural practice
- Approval of detailed plans for disturbance operations
- Land manager
- Advice to other bodies
- Implementing aspects of the project as a contractor for Water Corporation