

Forest Research & Monitoring

A SYNOPSIS AS AT OCTOBER 2001

Note that audit of environmental management systems, compliance with codes of practice, manuals etc or FORESTCHECK, is not considered in this document

Science Division



FIRE

1	<p>Name: Adrian Wayne</p> <p>Objective: To assess the impact of prescribed burning on the vertebrate fauna of the jarrah forest</p> <p>Departmental operation or activity being monitored: Spring and autumn prescribed burning</p> <p>Location: Batalling, Godfrey and Nunedine forest blocks, north-east of Collie</p> <p>Commencement of monitoring: February 1993</p> <p>Frequency of monitoring: Initially every three months, now every six months (March and October)</p> <p>Custodian: Adrian Wayne</p> <p>Data analysed? Underway.</p> <p>Progress as at October 2001 Monitoring suspended from May 2000. Field monitoring objectives achieved.</p>
2	<p>Name: Paul Van Heurck</p> <p>Objective: Impact of prescribed burning on the litter invertebrates of the central jarrah forest.</p> <p>(a) To examine the effects of spring and autumn prescribed burns on the terrestrial invertebrate fauna (particularly beetles) of <i>Eucalyptus marginata</i> forests.</p> <p>(b) To compile information on abundance, habitat preferences and life history strategies of the major invertebrate groups, and examine trends in species composition of selected groups (eg beetles)</p> <p>(c) To use data to refine existing guidelines for fire regimes in jarrah forests.</p> <p>Departmental operation or activity being monitored: Monitors the post-fire impact of prescribed burns of differing season and intensity, which were carried out in autumn 1993, spring 1994 and autumn 1996.</p> <p>Location: The study is located in the Batalling and Nunedine blocks approximately 35 km north-east of the Collie townsite. The 14 study sites were located on the Dwellingup soil and landform unit.</p> <p>Commencement of monitoring: November 1992 prior to the autumn 1993 prescribed fire at Fleays block</p> <p>Frequency of monitoring: November 1992 and March 1997 at 2-3 month intervals capturing 10,000 to 20,000 invertebrates per sample date.</p> <p>Custodian: Paul Van Heurck</p>

	<p>Data analysed? A preliminary BACI analysis has been carried out on the first 24 months of abundance data. A full BACI analysis is currently in progress for the final report.</p> <p>Progress as at October 2001 Progress reports 1 to 8 summarizing the preliminary conclusions from the laboratory sorting of invertebrate samples have been forwarded to the external funding body, the World Wide Fund For Nature, Australia, as has the final report which is also lodged at the Woodvale Library. The 4 years of data made up of 110,000 invertebrates has been BACI analysed and recommendations have been made on the appropriate fire management of the invertebrate biodiversity of the central jarrah forest.</p>
<p>3</p> <p>Name:</p> <p>Objective:</p> <p>Departmental operation or activity being monitored:</p> <p>Location:</p> <p>Commencement of monitoring:</p> <p>Frequency of monitoring:</p> <p>Custodian:</p> <p>Data analysed?</p> <p>Progress as at October 2001</p>	<p>Paul Van Heurck</p> <p>Conservation of tingle forests and the impact of prescribed burning on invertebrates</p> <p>(a) To examine the effects of prescribed burns on the common terrestrial invertebrate fauna of tingle forests (initially at the order level with particular emphasis on parameters such as total abundance, total species richness and total biomass, then examine trends in species composition of select, possible bio-indicator, invertebrate orders).</p> <p>(b) To survey and compile information on the role of prescribed fires in the seral creation or loss of microhabitats required for the persistence of uncommon or relic invertebrates in the Tingle forests.</p> <p>(c) Use these data to develop predictive models of the impact of fire on invertebrates and further refine the general principles and policies pertaining to management of fire in tingle forests.</p> <p>Monitors both the composition of uncommon forest floor invertebrates and the Gondwanan relict invertebrates at a number of time periods following both prescribed burns and wildfires.</p> <p>The study area is located in the Walpole-Nornalup National Park in forest of red tingle (<i>Eucalyptus jacksonii</i>) and yellow tingle (<i>Eucalyptus guilfoylei</i>).</p> <p>August 1996</p> <p>Not determined; current budget allows for only one annual cycle to be monitored eg August 1996, November 1996, January 1997 and March 1997.</p> <p>Paul Van Heurck</p> <p>Sampling data of the 12 sites (24 treatments by species richness and abundance) for November 1996 included 16,000 invertebrates.</p> <p>In this benchmark study, all 16,000 specimens were sorted to species level, revealing a species richness of 701</p>

6	Name:	Neil Burrows, Bruce Ward & Graeme Liddelow
	Objective:	To study the effects of various fire regimes on forest understorey plant species
	Departmental operation or activity being monitored:	CALM prescribed burning
	Location:	Southern and Central Forest Regions (McCorkhill, Yackelup and Lindsay forest blocks)
	Commencement of monitoring:	Lindsay (1972), Yackelup (1986), McCorkhill (1985)
	Frequency of monitoring:	Measured on rotational basis, with measurement prior to treatment burns (treatments on 3,5, 12, 24 years rotations)
	Custodian:	Neil Burrows
	Data analysed?	Data entered onto database (ongoing) and validated
	Relevant SPP:	93/99 (formerly 12/86)
	Progress as at October 2001	Burn treatments have been maintained and measurements to date have been entered onto a database and validated. A database of life histories and vital attributes has been compiled. Data are being prepared for fire seminar in April 2002.
7	Name:	Lachlan McCaw
	Objective:	To monitor the change in fuel conditions in a range of forest types protected from fire
	Departmental operation or activity being monitored:	Fuel accumulation, prescribed burning
	Location:	Southern Forest Region (various blocks)
	Commencement of monitoring:	From 1985
	Frequency of monitoring:	No regular measurement program, but sites are made available to scientists wishing to investigate particular biological attributes of long unburnt forest stands
	Custodian:	Lachlan McCaw
	Data analysed?	A register of Scientific Reference Areas for long unburnt fuels and No Planned Areas with area management plans has been compiled
	Relevant SPP:	none
	Progress as at October 2001	Ongoing. Some of the sites have been included in the experimental design for a retrospective study of the long term effects of fire and harvesting on biodiversity in karri forests.

8	<p>Name:</p> <p>Objective:</p> <p>Departmental operation or activity being monitored:</p> <p>Location:</p> <p>Commencement of monitoring:</p> <p>Frequency of monitoring:</p> <p>Custodian:</p> <p>Data analysed?</p> <p>Relevant SPP:</p> <p>Progress as at October 2001</p>	<p>Lachlan McCaw</p> <p>To monitor the effect of fuel reduction burning on the stocking, growth rate and condition of unthinned karri stands</p> <p>Prescribed burning</p> <p>Southern Forest Region (Walpole Nornalup National Park)</p> <p>From 1985-1987</p> <p>Annually for up to five years after treatment</p> <p>Lachlan McCaw</p> <p>Data entered into database and validated. Some analysis completed, and internal reports prepared</p> <p>15/85</p> <p>No further action taken since last report.</p>
9	<p>Name:</p> <p>Objective:</p> <p>Departmental operation or activity being monitored:</p> <p>Location:</p> <p>Commencement of monitoring:</p> <p>Frequency of monitoring:</p> <p>Custodian:</p> <p>Data analysed?</p> <p>Relevant SPP:</p> <p>Progress as at October 2001</p>	<p>Lachlan McCaw</p> <p>To monitor the emergence, survival and growth of seedlings of red tingle and karri following fuel reduction burning.</p> <p>Prescribed burning</p> <p>Southern Forest Region (Walpole Nornalup National Park)</p> <p>August 1996</p> <p>Monthly until August 1997, then six monthly thereafter while seedlings persist</p> <p>Lachlan McCaw</p> <p>Data collected and collated. Some preliminary analysis completed</p> <p>none</p> <p>Measurement of seedling survival and growth was continued for 2 years post-fire. Results were published in CALMScience 3(2): 87-94, April 2000.</p>
10	<p>Name:</p> <p>Objective:</p>	<p>Peter Keppel</p> <p>Post burn recovery / increase in numbers of brushtail wallaby (their numbers decrease significantly in long unburnt jarrah forests but recolonise after burning because</p>

	of fresh food source – new vegetation)
Departmental operation or activity being monitored:	Southern Forest Region prescribed burns (CALM)
Location:	Throughout SFR
Commencement of monitoring:	September 1978
Frequency of monitoring:	Ongoing
Custodian:	Peter Keppel
Data analysed?	Visual assessment only – no written report
Progress as at October 2001	No records of work done in recent years.

LOGGING AND FIRE

11 Name:	Adrian Wayne
Objective:	To assess the impact of logging and associated activities on medium sized mammals in the jarrah forest
Departmental operation or activity being monitored:	Logging, prescribed burning
Location:	Kingston, Warrup and Winnejup forest blocks, north-east of Manjimup
Commencement of monitoring:	April 1994
Frequency of monitoring:	Initially every two months (to February 1986), then every three months (February, May, August and December).
Custodian:	Adrian Wayne
Data analysed?	Yes, and ongoing
Progress as at October 2001	Analysis is ongoing but field monitoring ceased Dec 2000. Field monitoring objectives achieved. Parts of study are being incorporated into its successor, FORESTCHECK.
Publications, Reports and Landscape Article	<p>Morris, K., Johnson, B., Rooney, J., Ward, C. 2001. The short term impacts of timber harvesting and associated activities on the abundance of medium sized mammals in the Jarrah forest of Western Australia. In "Nature Conservation: Conservation in the Production Environments." Surrey Beatty.</p> <p>Morris, K., B. Johnson, P. Orell, G. Gaikhorst, A. Wayne and D. Moro 2000. 'Case Study: Conservation and Management of the Chuditch <i>Dasyurus geoffroii</i>.' For the Australian Mammal Society Dasyurid Symposium.</p> <p>Morris, K.D., Friend, G.R., Johnson, B.W., Orell, P., Ward, C., Rooney, J., Dillon, M., October 1996. The impact of timber harvesting and associated activities on the medium</p>

sized mammals in the jarrah forest: Interim Report Number 1.

Morris, K., Johnson, B., Rooney, J., Ward, C. November 1997. The impact of timber harvesting and associated activities on the abundance of medium sized mammals in the Jarrah forest of Western Australia: Internal Report and Presentation at the "Conservation in production environments – managing the matrix" Conference, in New Zealand.

Wayne, A., Rooney, J., Ward, C. and Wheeler, I., April 2001. Spotlight surveys to investigate the impacts of timber harvesting and associated activities within the jarrah forest of Kingston State Forest, with particular reference to the koomal (*Trichosurus vulpecula*) and ngwayir (*Pseudocheirus occidentalis*). Progress Report. Department of Conservation and Land Management.

Wayne, A., Wheeler, I., Ward, C. and Rooney, J., May 2001. The impacts of timber harvesting associated activities on the small terrestrial vertebrates of the Jarrah forest. Progress Report. Department of Conservation and Land Management.

Johnson, B., and Morris, K. 1998. What about the animals?: The Kingston Study Delivers. *Landscape* 14(2) Summer Issue 1998-1999, pp 21-27.

12	Name:	Graeme Liddelow
	Objective:	To monitor the composition and abundance of bird populations in regenerating karri forest following timber harvesting
	Departmental operation or activity being monitored:	Timber harvesting, specifically clearfelling with and without retained patches of mature trees. High intensity post-logging burning
	Location:	Southern Forest Region, Gray 6 coupe
	Commencement of monitoring:	Spring 1983
	Frequency of monitoring:	Twice annually (spring and autumn) from 1983 to 1989, then again in 1996/97
	Custodian:	Graeme Liddelow
	Data analysed?	Data entered into database, validated and analysed.
	Relevant Science Project Plan:	RWP 22/82. New SPP drafted
	Progress as at October 2001	Paper in press in Journal of Applied Ecology. Monitoring of sites now on a five year basis until regeneration age of <u>c.</u> 30 yrs.

13	Name:	G Liddelow
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	Objective:	Effect of forest operations on the bird population in jarrah forest
	Departmental operation or activity being monitored:	Falling, burning and regeneration
	Location:	Kingston block
	Commencement of monitoring:	1994
	Frequency of monitoring:	Twice yearly in Feb/March and Nov/Dec
	Custodian:	1994 to 1997 Mike Craig, UWA Zoology Dept. From 1997 onward G Liddelow, Science Division, Manjimup
	Data analysed?	Kingston pre 1997, see Mike Craig UWA PhD Thesis.
	Progress as at October 2001	Data entered into database and validated, some analysis completed. Preliminary results were presented at the Kingston Workshop. Monitoring of the bird populations will continue on a once yearly basis in Spring for a further five years or until population trends stabilize.
14	Name:	Adrian Wayne
	Objective:	Investigation of the impacts of timber harvesting and associated activities on the western ringtail possum (<i>Pseudocheirus occidentalis</i>) in Kingston forest block
	Departmental operation or activity being monitored:	Jarrah timber harvesting
	Location:	Kingston forest block
	Commencement of monitoring:	February 1997
	Frequency of monitoring:	Monitoring ceased (July 2000), field monitoring objectives achieved. The project is currently being succeeded by a new, more comprehensive ecological study on the ecology of the western ringtail and common brushtail possums.
	Custodian:	Adrian Wayne
	Data analysed?	Yes
	Report	Wayne, A., Ward, C., Rooney, J., and Wheeler, I. December 2000. The immediate impacts of timber harvesting and associated activities on the Ngwayir (<i>Pseudocheirus occidentalis</i>) in the Jarrah forest of Kingston State Forest Block. Progress Report. Department of Conservation and Land Management.
15	Name:	Nannup District (Brad Commins)
	Objective:	Biophysical monitoring: Collection of data on mammals, reptiles, birds and plants at permanent and temporary monitoring sites within the district to determine

		presence/absence, response to logging, response to fire and response to fox-baiting
Departmental operation or activity being monitored:		Monitor the effects of logging, fire and fox-baiting are being monitored as well as increasing the CALM fauna database on species distribution
Location:		Monitoring is taking place in 15 locations, which include forest blocks, proposed conservation parks and national parks
Commencement of monitoring:		1992
Frequency of monitoring:		Continued on a bi-monthly basis since 1992, ie on average 6 surveys have been completed each year. Repeated monitoring at each individual site takes place on a yearly or bi-yearly basis
Custodian:		Data are held at the Kirup and Nannup offices and will soon be entered into the fauna database being developed by Peter Orell (Wildlife Branch)
Data analysed?		Data already collected have been analysed on a simple level at the district.
Progress as at October 2001		No report.

16	Name:	Joe Kinal
	Objective:	To determine the responses of a water catchment to logging and burning; the effects on water yield, vegetation structure, and stand growth
	Departmental operation or activity being monitored:	Logging and burning
	Location:	Yarrigal forest block
	Commencement of monitoring:	1980
	Frequency of monitoring:	Intermittent
	Custodian:	Dr Geoff Stoneman
	Data analysed?	Yes
	Relevant SPP:	Dwellingup LE323, 416, 417
	Progress as at October 2001	LE323, 416, 417 have stopped and been replaced by SPP 2000/03. Monitoring in SPP 2000/03 commenced July 1999.

DISEASE

17	Name:	Mike Stukely
	Objective:	Survival and growth of jarrah trees, including:

		<ul style="list-style-type: none"> - Dieback-resistant jarrah (DRJ) clones planted on minesites (1988 on) or DFR sites (1994 on); - Seedlings planted for 1985 trial of resistance; - Parent trees from which DRJ selections have been derived.
	Departmental operation or activity being monitored:	Forest rehabilitation
	Location:	25 sites in Swan Region; 12 sites in the Central Forest Region. Note: These sites planted at various times, 1985-96; more to be planted 1997.
	Commencement of monitoring:	First: 1984-85 (parents and earliest plantings). Note: Each DFR planting is monitored first at age 1 year.
	Frequency of monitoring:	DFR plantings generally at 5 yr intervals; Inoculation plots more often in early years; Parents infrequently.
	Custodian:	Mike Stukely
	Data analysed?	Earlier plots – analysed. Post 1994 plots – not yet fully analysed
	Progress as at October 2001	<p>Minimal monitoring as no funds available. Full measurement of 1988 clonal validation trial done 6/2001. Additional operational planting's established in 1997 (Swan 5 sites, Central 1 site), 1998 (Swan 2, Central 1), 1999 (Swan 4).</p> <p>Validation trial est. 1998 (1) -- monitored 1999.</p> <p>Validation trials est. 1999 (2) – monitored frequently 1999 - 2001. To be analysed.</p> <p>DRJ clonal seed orchard (stage 1) est. at PPC Manjimup, 2001.</p>
18	Name:	Mike Stukely
	Objective:	Mundulla Yellows (MY) disease incidence and spread in WA.
	Departmental operation or activity being monitored:	
	Location:	
	Commencement of monitoring:	October 2000
	Frequency of monitoring:	At least annual.
	Custodian:	Mike Stukely
	Data analysed?	
	Progress as at October 2001	Preliminary information on MY distribution in south-west obtained. Samples from symptomatic trees sent to Univ. Adelaide have produced several positives in molecular test

for viral RNA. At least 5 species of eucalypt are affected in WA. Final results of first year's samples are awaited, for report.

19	Name:	Richard Robinson
	Objective:	<ul style="list-style-type: none"> (a) To monitor the presence and determine the impact of <i>Armillaria</i> root disease in karri regrowth forests (b) To investigate possible control of <i>Armillaria</i> root disease in karri regrowth forests (c) To monitor the presence and determine the impact of incipient rot (brown wood) and decay in karri regrowth forests
	Departmental operation or activity being monitored:	(a) and (b) Thinning and logging operations
	Location:	<ul style="list-style-type: none"> (a) Babbington, Dombakup, Brockman, Gray, Poole and Warren blocks (b) Warren block (c) Throughout the range of karri regrowth
	Commencement of monitoring:	<ul style="list-style-type: none"> (a) June 1995 (b) November 1992 (c) 1986
	Frequency of monitoring:	<ul style="list-style-type: none"> (a) June 1995, June 1996, June 1997 (b) 4-5 times, June 1993, June 1994, June 1995 and June 1996, and Sept 1997 (final).
	Custodian:	Richard Robinson and Martin Rayner
	Data analysed?	<ul style="list-style-type: none"> a) Data analysis continuing b) Data analysis complete c) Data have not been fully analysed
	Progress as at October 2001	<ul style="list-style-type: none"> a) Report "<i>Armillaria luteobubalina</i> in regrowth karri forests" by R Robinson and M Rayner submitted in Feb 1998 (in Forest Science Library). Progress report (SPP 98/0006) "Below ground incidence of <i>Armillaria luteobubalina</i> in regrowth karri forests" by R Robinson submitted in Nov 1998 (in Forest Science Library). Two scientific papers in final preparation stages. b) Progress reports (SPP 95/0001) "A comparison of chemical and biological methods for control of <i>Armillaria luteobubalina</i> in regrowth karri" by R Robinson, Sept 1997 and Sept 1998 (in Forest Science Library). Scientific paper accepted by Australian Forestry "Fumigation of regrowth karri stumps with metham-sodium to control <i>Armillaria luteobubalina</i> "by

20	Name:	
	Objective:	To determine the effect of fertilization of plantings, clearing and soil cultivation, addition of a minor understorey seed mix, and broadcast fertilizing on survival and growth of standard jarrah seedlings and <i>Phytophthora cinnamomi</i> resistant plants
	Departmental operation or activity being monitored:	N/A
	Location:	Park, Nanga and Keates forest blocks
	Commencement of monitoring:	1994
	Frequency of monitoring:	Biannually since 1994
	Custodian:	Mike Stukely
	Data analysed?	Yes partial analysis completed
	Relevant SPP:	93/94
	Progress as at October 2001	Plots monitored last in 1999.
21	Name:	F Podger and S Carstairs
	Objective:	To identify which of several species of <i>Phytophthora</i> , including <i>P. cinnamomi</i> , are primary pathogens in karri forest ecosystems.
	Departmental operation or activity being monitored:	
	Location:	Weld Catchment
	Commencement of monitoring:	August-September 1995
	Frequency of monitoring:	Quarterly
	Custodian:	F Podger and S Carstairs
	Data analysed?	The data are being re-assessed with each monitoring event
	Progress as at October 2001	Data held by J. Murch, Forest Products Commission.
22	Name:	F Podger and S Carstairs
	Objective:	To determine whether or not pavement stabilizing agents are fungistatic to <i>P. cinnamomi</i>

Departmental operation or activity being monitored:	Assessment of the dispersion of inoculum of <i>Phytophthora</i> during road maintenance operations
Location:	Carey block
Commencement of monitoring:	April-May 1996
Frequency of monitoring:	Annually
Custodian:	F Podger and S Carstairs
Data analysed?	The data are being re-assessed with each monitoring event
Progress as at October 2001	Data held by J. Murch, Forest Products Commission.

23	Name:	N Gibson
	Objective:	Impact of <i>Phytophthora cinnamomi</i> deliberately introduced to vegetation of jarrah forests
	Departmental operation or activity being monitored:	
	Location:	Karnet
	Commencement of monitoring:	October 1964
	Frequency of monitoring:	1996
	Custodian:	F Podger and N Gibson
	Data analysed?	Currently being analysed
	Progress as at October 2001	This SPP is currently suspended due to commitments to the Salinity Action plan. No further work since 1997.

PEST INSECTS

24	Name:	Tom Burbidge
	Objective:	Expansion of jarrah leafminer
	Departmental operation or activity being monitored:	Prescribed burning and logging
	Location:	State Forest between Dwellingup and Collie (jarrah forest)
	Commencement of monitoring:	1986 (October/November)
	Frequency of monitoring:	7 times (spring 1987, 88, 89, 90, 92, 96, 99)
	Custodian:	I Abbott

	Data analysed?	Yes, 1986-90 published in <i>CALM Technical Report 28</i> (1992) and 1987-92 published in <i>Landscape</i> 11(1): 43-47 (1995)
	Progress as at October 2001	Map for 1999 lodged in CALM Library.
25	Name:	I Abbott
	Objective:	Levels of infestation by jarrah leafminer (and other herbivorous insects on jarrah leaves)
	Departmental operation or activity being monitored:	Logging, prescribed burning
	Location:	Mundaring to Dwellingup, Collie, Manjimup (State Forest – jarrah forest)
	Commencement of monitoring:	November 84 (Manjimup), November 85 (Mundaring to Dwellingup) and October 87 (Collie)
	Frequency of monitoring:	1985-6-7-8-9 (Manjimup); 1985-7-9 (Mundaring-Dwellingup); 1988-9 (Collie)
	Custodian:	I Abbott
	Data analysed?	Yes, published in <i>Forest Ecology and Management</i> 58: 85-110 (1993).
	Progress as at October 2001	No further monitoring necessary at this stage (no outbreaks).
26	Name:	Janet Farr
	Objective:	To determine <i>Uraba lugens</i> population levels particularly in respect to any increasing trend which could lead to outbreak. <i>U. lugens</i> levels are monitored on Jarrah
	Departmental operation or activity being monitored:	No Departmental operation is monitored
	Location:	At present monitoring is done on 45 trees dispersed throughout Manjimup and Pemberton Districts
	Commencement of monitoring:	January 1986
	Frequency of monitoring:	Every January
	Custodian:	1986-1988 Ian Abbott 1989 - Janet Farr
	Data analysed?	Data have been entered on database and validated. Since January 1998 presence or absence of <i>U. lugens</i> recorded. Prior to this a quantitative measure of <i>U. lugens</i> populations levels was made.

Progress as at October 2001 Project terminated in 1996. Data on quantitative survey partially analysed and planned for joint report on Jarrah Leaf miner and Uraba outbreak. Related studies on biology and distribution complete. Manuscript on biology in press with Australian Journal of Entomology. Manuscript on distribution and affect of management practices in preparation.

27 Name: Janet Farr

Objective: To determine infestation rate of karri in respect to Bulls Eye Borer (*Phoracantha acanthocera*)

Departmental operation or activity being monitored: Borer presence is monitored in burnt and unburnt karri

Location: Monitoring sites are across rainfall gradient in 20-35 year old karri in the Manjimup, Pemberton and Walpole Districts

Commencement of monitoring: Autumn, winter 1997

Frequency of monitoring: Continuance is dependant on results

Custodian: Janet Farr

Data analysed? Yes

Relevant SPP:

Progress as at October 2001 Project completed 1998; Published in Australian Forestry 2000, 63: 107-123.

WEED CONTROL

28 Name: Nannup / Kirup Office (Brad Commins)

Objective: Weed monitoring: Regular spraying and follow-up inspection of declared and other weeds

Departmental operation or activity being monitored: Monitoring for presence/absence of weeds and responses to control treatments

Location: All CALM estate within the district

Commencement of monitoring: Ongoing for at least the last 30 years

Frequency of monitoring: Yearly or bi-yearly basis, depending on target weed species

Custodian: Data are on file at the Kirup and Nannup Offices

Data analysed? Not analysed

Progress as at October 2001 Regular spraying done in priority one areas and within the approved budget. Areas treated are monitored annually.

SILVICULTURE

29 Name: M Rayner

Objective: a) Growth rate
b) Harvesting, regeneration, silvicultural treatment

Departmental operation or activity being monitored: As above

Location: a) 800+ permanent plots throughout State forest
b) throughout State forest

Commencement of monitoring: a) 1916
b) 1918

Frequency of monitoring: a) Major periods of establishment in the 1940's, 1970's, 1980's. Remeasurement of plots has been intermittent and significant to periodic revision.
b) Annually

Custodian: Manager, Forest Management Branch

Data analysed? a) Several times. Used at time of revision of yield estimates
b) Reported annually

Progress as at October 2001 a) Ongoing program of review of plot representation
b) Reported annually

30 Name: FPC Manjimup (Mark Virgo / Greg Hodgson)

Objective: Establishment of jarrah lignotuber growth after timber harvesting

Departmental operation or activity being monitored: Jarrah timber harvesting and jarrah tops burning

Location: Rocky forest block, Walpole District

Commencement of monitoring: 23 September 1996

Frequency of monitoring: Try for every 6 months. Subsequent monitoring has taken place on 22 May 1996

Custodian: Walpole District with Silviculture Officer – photos only

Data analysed? Photos taken, no data collected

	Progress as at October 2001	Work transferred to Forest Products Commission, Manjimup.
31	Name: Objective: Departmental operation or activity being monitored: Location: Commencement of monitoring: Frequency of monitoring: Custodian: Data analysed? Relevant SPP: Progress as at October 2001	Lachlan McCaw To monitor changes in stand structure and fuel accumulation in unthinned karri regrowth stands protected from fire for up to 50 years Fuel accumulation, prescribed burning Southern Forest Region (regrowth stands in ten forest blocks) From 1985 All sites assessed in 1985, and a selection of these were re-assessed in 1995 Lachlan McCaw Data entered in database and validated. Some preliminary analysis completed RPP 21/85 Trends in stand structure and fuel accumulation in a sequence of stands up to 70 years post-harvesting have been reported on in a scientific paper to be published in Forest Ecology and Management (in press).
32	Name: Objective: Departmental operation or activity being monitored: Location: Commencement of monitoring: Frequency of monitoring: Custodian: Data analysed? Relevant SPP:	Lachlan McCaw To investigate the effect of initial spacing on the growth, development and form of planted karri seedlings Regeneration and stand establishment Southern Forest Region (Nairn and Wheatley blocks) Nairn 1982, Wheatley 1991 Re-measured every one or two years during establishment phase (age 1-5 years), then five yearly thereafter Lachlan McCaw Data entered into database and validated. Some preliminary analysis completed 93/107

<p>Progress as at October 2001</p>	<p>Wheatley block spacing experiment was re-measured in spring 2000 at age 10 years to determine effects of initial spacing on growth and form. Results are reported on as part of a project on regeneration success measures funded by Wood and Paper Industry Strategy.</p>
<p>33</p> <p>Name:</p> <p>Objective:</p> <p>Departmental operation or activity being monitored:</p> <p>Location:</p> <p>Commencement of monitoring:</p> <p>Frequency of monitoring:</p> <p>Custodian:</p> <p>Data analysed?</p> <p>Relevant SPP:</p> <p>Progress as at October 2001</p>	<p>Lachlan McCaw</p> <p>To monitor the growth and development of regrowth karri stands subject to a range of thinning, fertilizer and coppice control treatments</p> <p>Karri thinning</p> <p>Southern Forest Region (Warren, Treen Brook, Poole, Sutton blocks)</p> <p>From 1985</p> <p>Annually for the first five years after treatment, then every five years thereafter</p> <p>Lachlan McCaw</p> <p>Data entered in database and validated. Some preliminary analysis completed</p> <p>93/106</p> <p>Warren block thinning experiment re-measured in January 2000 to determine growth, form and incidence of <i>Armillaria</i> root disease.</p>
<p>34</p> <p>Name:</p> <p>Objective:</p> <p>Departmental operation or activity being monitored:</p> <p>Location:</p> <p>Commencement of monitoring:</p> <p>Frequency of monitoring:</p> <p>Custodian:</p> <p>Data analysed?</p> <p>Relevant SPP:</p>	<p>Kim Whitford</p> <p>Seedfall in jarrah pole stands, effects of stand density, fertilizer and season</p> <p>Inglehope forest block</p> <p>14 February 1994</p> <p>Regular monthly measurements since first measurement</p> <p>Kim Whitford</p> <p>Partial analysis has been completed</p> <p>93/94</p>

Progress as at October 2001 Nil.

35 Name: Kim Whitford

Objective: Growth of jarrah pole trees and stands; effects of stand density, and fertilizer

Departmental operation or activity being monitored: Effect of stand density on growth of jarrah pole trees and stands

Location: Inglehope forest block

Commencement of monitoring: 1964

Frequency of monitoring: Intermittently biannual since 1964

Custodian: Dr Geoff Stoneman

Data analysed? Yes

Relevant SPP: 93/94

Progress as at October 2001 Nil, but site maintained for future measurements of tree growth.

FAUNA

36 Name: Peter Mawson

Objective: WESTERN SHIELD. Monitoring of native fauna (mammals, birds, reptiles) at selected sites throughout the jarrah, karri and wandoo forests to determine their response to reduction in introduced predator (eg fox) numbers. The monitoring will also cover populations of native fauna re-introduced into areas cleared of predators, and those populations of native fauna from which animals are sourced for the translocations.

Departmental operation or activity being monitored: Initially the monitoring activities will be conducted by SID and Regional and District staff. As particular SID projects wind up the monitoring of some of these sites will be transferred to Regional and District staff.

Location: The exact location of the monitoring sites in the forest (there are other sites outside of forested areas) has not been finalized for all Regions. It is likely that the sites will be as follows:

Region:	Current Mon. Sites	Proposed Mon. Sites
Swan	Julimar CP, Hills Forest	-
Cntrl Forest	Lane Poole CP, Batalling SF	-
Wheatbelt	Dryandra SF, Boyagin NR	-

	Sthn Forest -	Giants, Woolbales, Denbarker, Mitchell and Wheatley blocks
	Sth Coast Stirling Range NP	a site west of Albany
Commencement of monitoring:	Monitoring at the existing sites has been in place for varying lengths of time, dating back as far as 1990	
Frequency of monitoring:	Monitoring conducted by SID can be as frequently as every 2 months. Monitoring to be conducted by the Regions and Districts will probably be annual, or twice per year at most.	
Custodian:	Custodians of the databases (2) will be the Senior Zoologist and Zoologist at Wildlife Branch	
Data analysed?	No	
Progress as at October 2001	No report available.	

NUMBAT

37	Name:	Tony Friend
	Objective:	Numbat population dynamics
	Departmental operation or activity being monitored:	Reintroduction of numbats, fox control
	Location:	(a) Dryandra (b) Batalling (c) Northern jarrah forest between Jarrahdale and Mundaring (d) Perup NR/Kingston forest
	Commencement of monitoring:	(a) 1982 (b) 1992 (c) 1997 (d) 1994
	Frequency of monitoring:	(a) annually, November 1982-1993, then bi-annually, April and November 1994-2001 (b) annually 1992-1997; March 2000 (c) Annually 1997-2001 (d) bi-annually, February and September 1994-1997; then January 1998
	Custodian:	Tony Friend
	Data analysed?	Yes

Progress as at October 2001**Publications:**

Friend, T. and Thomas, N. (2001). Numbats forever!
Landscape (Spring 2001). Pp. 17-22.

Reports:

Friend, J.A. (1998). Numbat Recovery Team. Annual report 1997. Department of Conservation and Land Management, Perth.

Friend, J.A. (2000). Numbat Recovery Team. Annual report 1999. Department of Conservation and Land Management, Perth.

WOYLIE

38	Name:	District Manager, Hills District
	Objective:	Woylie Translocation
	Departmental operation or activity being monitored:	Condition of translocated population
	Location:	Two transects in Mundaring District
		1. Hills Forest North (HFN) 20 released in April 1996, 20 more in March 1998.
		2. David/Qualen Road (D/Q Rds)
	Commencement of monitoring:	1. 1996
		2. 1998
	Frequency of monitoring:	1. Bi-annually since 1996
		2. Annually 1997, 1998 (1999 missed) 2000. Next 2002, 2004 etc.
	Custodian:	CALM Mundaring WC
	Data analysed?	Graphs prepared
	Progress as at October 2001	1. No woylies captured in 2001. Planned "top up translocation" of 40 plus animals for 2001-2002.
		2. Ceased annually monitoring in 2000. No woylies ever captured. Future monitoring every 2 years.

CHUDITCH

39	Name:	Keith Morris
	Objective:	To assess the success of a Chuditch reintroduction to Julimar Conservation Park in 1992

Departmental operation or activity being monitored:	Now part of the Mundaring District fauna management program
Location:	Julimar Conservation Park
Commencement of monitoring:	June 1992
Frequency of monitoring:	Initially four times a year, now once a year (July/August)
Custodian:	Keith Morris / Brent Johnson
Data analysed?	Partially
Progress as at October 2001	Ongoing monitoring by the Mundaring District in July of each year, population is persisting with trap success rates being maintained at 2-4%. Results to be incorporated into a review of the conservation status of chuditch.

40 Name:	District Manager, Hills District
Objective:	Chuditch Recovery Plan
Departmental operation or activity being monitored:	Response of natural population to foxbaiting
Location:	Two transects in Mundaring District 1. Hills Forest North (HFN) 2. Hills Forest South (HFS)
Commencement of monitoring:	1993
Frequency of monitoring:	Bi-annually since 1993
Custodian:	Nature Conservation Officer, Mundaring WC
Data analysed?	Graphs prepared
Progress as at October 2001	1. Stable populations. 2. All mammals in low numbers

FOREST RED-TAILED BLACK COCKATOO

41 Name:	Ian Abbott
Objective:	To assess the current distribution of the FRTBC
Departmental operation or activity being monitored:	Timber harvesting and clearing for agriculture and settlement (the effect these factors may exert on the supply of suitable nest sites, viz hollows in standing trees)

Location:	Southwest, Dandaragan to Fitzgerald River NP
Commencement of monitoring:	October 1995 – February 1996
Frequency of monitoring:	October-February 1995/6 and 1999/2000
Custodian:	Dr Ian Abbott
Data analysed?	Yes
Progress as at October 2001	Two publications: Abbott, I. 1998. Counting cockatoos: The status of the Forest red-tailed black cockatoo. <i>Landscape</i> 13(2) : 10-16. Abbott, I. 1998. Conservation of the Forest red-tailed black cockatoo, a hollow-dependent species, in the eucalypt forests of Western Australia. <i>Forest Ecology & Management</i> 109: 175-185. A web page, Karrak-Watch, is also under preparation.

RARE FROG HABITAT

42 Name:	Nannup Office - Brad Commins
Objective:	Feral pig monitoring: The inspection of threatened frog habitat for presence of pigs. Objective is to protect threatened frog habitat by destroying pigs, which approach habitat sites
Departmental operation or activity being monitored:	No departmental activity is being monitored
Location:	One forest block (Adelaide-Capes district)
Commencement of monitoring:	1995
Frequency of monitoring:	6-monthly basis
Custodian:	Nannup office
Data analysed?	Not analysed
Progress as at October 2001	Feral pig activity monitored throughout the year. Volunteer pig control program is targeted around the frog habitat areas. Monitoring is ongoing.

FLORA

43 Name:	Various, including research, contractors and volunteers
Objective:	Threatened and priority flora monitoring: The inspection of threatened and priority flora populations. Object of

	monitoring is to protect threatened and priority flora from negative impacts.
Departmental operation or activity being monitored:	No specific departmental operation is being monitored
Location:	Total of 3474 sites within the 3 forest regions. (Swan: 610 DRF and 1049 PF; Central Forest: 358 DRF and 775 PF; Southern Forest: 167 DRF and 515 PF). Sites are on a variety of tenures.
Commencement of monitoring:	Commenced with the DRF/priority flora system was established
Frequency of monitoring:	Ongoing with frequency of monitoring depending on priority of species, accessibility of site, and degree of threat to the site.
Custodian:	Wildlife Branch is the custodian of the data, copies of all records are also retained at the relevant Regional/District office
Data analysed?	Wildlife Branch analyse the data
Progress as at October 2001	Ongoing.
44 Name:	Susan Patrick
Objective:	To determine the fire response of Declared Rare Flora <i>Anthocercis gracilis</i>
Departmental operation or activity being monitored:	N/A
Location:	Swan Region, North Dandalup, Parklands and Recreation Reserve, 21038, north side of North Dandalup River, c. 500m west of North Dandalup Dam
Commencement of monitoring:	April 16, 1993
Frequency of monitoring:	4.5.93, 20.5.93, 22.6.93, 30.8.93, 30.11.93, 26.4.94, 12.10.94, 17.11.94, 10.5.95, 18.9.95, 9.10.95
Custodian:	S Patrick – general flora information; H Stace – statistical information
Data analysed?	Yes
Progress as at October 2001	No further monitoring.