

Protocols for Measuring and Reporting on the Key Performance Indicators of the Forest Management Plan 2004-2013



Sustainable Forest Management Series

Department of Environment and Conservation
SFM Manual No.2
2007



Department of
Environment and Conservation

Department of Environment and Conservation

17 Dick Perry Av, Western Precinct

Technology Park

Kensington

Western Australia 6151

Telephone (08) 9423 2333

Facsimile (08) 9423 2432

WEBSITE: www.naturebase.net

EMAIL: information@dec.wa.gov.au

Reference details

The recommended reference for this publication is: Department of Environment and Conservation 2007, Protocols for Measuring and Reporting on the Key Performance Indicators of the *Forest Management Plan 2004-2013*, Department of Environment and Conservation, Sustainable Forest Management Series, SFM Manual No. 2.

Table of Contents

1.	Preamble	4
2.	Responsibilities	6
3.	KPI 1 - The representation of forest ecosystems in formal reserves	8
4.	KPI 2 - The status of (critically endangered, endangered, vulnerable, conservation dependent) forest-dwelling species and ecological communities as determined by listing	18
5.	KPI 3 - The status of selected threatened or conservation dependent species that are the subject of management actions to protect them	27
6.	KPI 4 - The area of native forest and plantations	33
7.	KPI 8 - The presence of Sirex in softwood plantations.....	39
8.	KPI 14 - Access for apiculture.....	43
9.	KPI 15 - Wildflowers and seed picking.....	48
10.	KPI 20 - Percentage of water bodies (e.g. stream kilometres, lake hectares) with significant variance of biodiversity from the historic range of variability	54
11.	KPI 21 - The level of soil damage resulting from timber harvesting	59
12.	KPI 23 - The identification and protection of cultural heritage	67
13.	KPI 24 - Consultation and involvement of Aboriginal people in forest management	73
14.	KPI 25 - The protection of heritage places through representation in reserves	76
15.	KPI 26 - Number, range and use of recreation/tourism activities available by proposed land category in the plan area	82
16.	KPI 27 - Basic raw material supply	88
17.	KPI 28 - Adaptive management.....	93
18.	KPI 29 - Provide for public involvement activities and public education, awareness and extension programs and make available forest-related information.....	96
19.	KPI 30 - Develop and maintain human resource skills across relevant disciplines.....	104
20.	KPI 31 - Development of scientific understanding of ecosystem characteristics and functions.....	110
21.	KPI 32 - Environmental management system.....	117
22.	KPI 33 - Operational control	120

1. Preamble

The *Forest Management Plan 2004-2013* (hereafter referred to as the Forest Management Plan) requires the development of protocols for 33 Key Performance Indicators (KPI). These performance indicators have been developed to assess the effectiveness of the plan in meeting its objectives and to measure progress towards the implementation of its proposals.

The Montreal Criteria for sustainability were considered a suitable framework for developing performance indicators. They are grouped according to the following criteria:

- the conservation of biodiversity;
- the maintenance of productive capacity;
- the maintenance of ecosystem health and vitality;
- the conservation and maintenance of soil and water;
- the maintenance of heritage;
- the maintenance of socio-economic values; and
- plan implementation.

The Indicators are designed to measure any or all of the three elements of a management issue. These elements are:

- the condition of the subject under consideration;
- the pressure(s) that might be affecting the subject; and
- the response to those pressures by management.

Principles are necessary to select the most appropriate 'key' performance indicators. The principles used for the plan will relate to their capacity to:

- represent community concerns;
- operate at a range of scales;
- satisfy other reporting requirements;
- measure critical elements necessary for adaptive management; and
- balance the provision of environmental and socio-economic benefits.

The extent to which a performance indicator can be implemented may be limited by the availability of data for reporting, capacity to obtain measurable data, and the cost of implementation. Performance indicators therefore target 'key' aspects of the plan.

This document provides the protocols for 20 of the 33 KPI in the Forest Management Plan. The other 13 KPI are not sufficiently developed to publish at this stage. This document will be updated to include the additional KPI as they become available for publication.

The protocol for measuring and reporting each key performance indicator is divided into two sections. The first section details background information from the Forest Management Plan. This includes the overall objective of the Forest Management Plan in relation to the broad criteria for sustainability, the specific objectives according to each criterion for sustainability, and relevant actions from the Forest Management

Plan. Any text within this section of the document that is taken directly from the Forest Management Plan is shown in italics.

The second section outlines the protocol for reporting. This includes the specific objective for the KPI, rationale, background and context, issues (data quality and interpretation), the entity to be measured, required data, calculation method, reporting timeframes, and data presentation. A work instruction section provides further information about data collection and data presentation for the relevant custodians. Some protocols will differ marginally from this format due to the type of data required.

The overall objective and actions of the Forest Management Plan in relation to Plan Implementation is:

Objective:

The plan proposes the following Actions for the purpose of seeking to ensure that forest management is undertaken in accordance with the plan and is continually improved so as to achieve best practice: (Forest Management Plan p61)

Monitoring and audit

Objective:

The plan proposes the following Actions for the purpose of seeking to monitor and audit the extent to which management of land to which the plan applies is undertaken in accordance with the plan:

Most relevant actions:

32.6 *The Department, in consultation with the Conservation Commission, will develop a protocol for each key performance indicator in the plan, which will:*

32.6.1 *identify the data to be collected and analysed in assessing the extent to which the key performance indicator has been achieved; and*

32.6.2 *specify the persons who are responsible for the collection and analysis of that data.*

2. Responsibilities

The Forest Policy and Practices Branch of the Department of Environment and Conservation (DEC) has undertaken the responsibility of developing the protocols for the KPI, in consultation with information custodians and the Conservation Commission, and will continue with this responsibility by completing this process for the remaining protocols as they become available. The Forest Policy and Practices Branch also has the role of collating the information provided by custodians for each of the KPI into an annual report.

The responsibility for reporting against individual KPI falls to a range of custodians from within DEC and other agencies as identified in Table 1.

Table 1: Reporting responsibilities for Key Performance Indicators for which approved protocols have been developed

KPI	Title of KPI	Reporting timeframe	Relevant agencies/data custodians with reporting responsibilities
1	The representation of forest ecosystems in formal reserves	Biennially	Information Management Branch Forest Management Branch Parks and Visitors Services Division
2	The status of (critically endangered, endangered, vulnerable, conservation dependent) forest dwelling species and ecological communities as determined by listing.	Annually	Nature Conservation Division
3	The status of selected threatened or conservation dependent species that are the subject of management actions to protect them.	Annually	Nature Conservation Division
4	The area of native forests and plantations	Five years	Forest Management Branch Forest Products Commission
8	The presence of Sirex in softwood plantations.	Annually	Forest Products Commission
14	Access for apiculture.	Biennially	Parks and Visitors Services Division
15	Wildflowers and seed picking.	Annually	Nature Conservation
20	Percentage of water bodies (e.g. stream kilometres, lake hectares) with significant variance of biodiversity from the historic range of variability.	Five years	Science Division
21	The level of soil damage resulting from timber harvesting.	Annually	Regional Services Division Forest Policy and Practices Branch Forest Products Commission
23	The identification and protection of cultural heritage.	Annually	Information Management Branch Regional Services Division Forest Policy and Practices Branch Parks and Visitors Services Division
24	Consultation and involvement of Aboriginal people in forest management.	Annually	Sustainable Forest Management Division

KPI	Title of KPI	Reporting timeframe	Relevant agencies/data custodians with reporting responsibilities
25	The protection of heritage places through representation in reserves.	Biennially	Information Management Branch
26	Number, range and use of recreation/tourism activities available by proposed land category in the plan area.	Annually	Parks and Visitors Services Division Regional Services Division
27	Basic raw material supply.	Annually	Nature Conservation Division
28	Adaptive management.	Five years	Forest Policy and Practices Branch Forest Products Commission
29	Provide for public involvement activities and public education, awareness and extension programs and make available forest- related information.	Annually	Regional Services Division Parks and Visitors Services Division Strategic Development and Corporate Affairs Division
30	Develop and maintain human resource skills across relevant disciplines.	Annually	Corporate Services Forest Products Commission
31	Development of scientific understanding of ecosystem characteristics and functions.	Annually	Science Division
32	Environmental management system.	December 2005	Forest Policy and Practices Branch
33	Operational control.	Annually	Forest Policy and Practices Branch

3. KPI 1 - The representation of forest ecosystems in formal reserves

3.1. Background information from the Forest Management Plan

The overall objective of the Forest Management Plan in relation to biological diversity is:

The plan proposes the following Actions at the whole of forest scale for the purpose of seeking to conserve biodiversity and seeking to conserve self-sustaining populations of native species and communities, and at the landscape scale for the purpose of seeking to allow for the recovery of biodiversity between one timber rotation and the next. (Forest Management Plan p23)

Forest Management Plan extract (page 30)

<i>Key performance indicator 1</i>	<i>The representation of forest ecosystems in formal reserves.</i>
<i>Performance measure</i>	<i>Area of each forest ecosystem by land category (existing and proposed separately).</i>
<i>Performance target(s)</i>	<i>The Department and the Conservation Commission to complete all actions for which they are responsible in order to formally change the land category of areas proposed for the reserve system within ten years after the commencement of the plan.</i>
<i>Reporting</i>	<i>Biennially on progress.</i>
<i>Response to progress shortfall</i>	<i>The Department to investigate lack of progress and report to the Conservation Commission and to the Minister for the Environment. The Department to address those impediments within its control and the Department and the Conservation Commission to advise the Minister for the Environment on measures to address other impediments.</i>

The objective in relation to the establishment of formal reserves is:

The plan proposes the following actions at the whole of forest scale for the purpose of seeking to conserve biodiversity and ecological integrity in all native forest ecosystems through the establishment and management of a system of reserves that is comprehensive, adequate and representative: (Forest Management Plan p24)

Most relevant Forest Management Plan actions:

- 1.1 *The Department will initiate the processes required for the land category changes proposed by the plan by:*
 - 1.1.1 *undertaking fine scale reserve design for the parks proposed in the Protecting our old -growth forests policy so as to include within the parks old-growth forest adjacent to the nominal boundaries;*
 - 1.1.2 *facilitating the Government's community consultation process on fine-scale reserve design; and*
 - 1.1.3 *consulting with the Conservation Commission and then advising the Minister for the Environment on final reserve boundaries. Consultation*

with the community and affected government and local government authorities as contemplated by Action 1.1.2 may result in minor amendments to the boundaries of reserves shown on Map 3 and Map 5.

- 1.2 *The Department will manage the areas proposed by Appendix 2 for inclusion in a national park, nature reserve or conservation park consistently with their proposed land category and purpose and relevant Departmental policies until such time as they are formally created. Timber production in these areas will not be permitted.*
- 1.3 *The Department will cooperate with the Departments of Environment and Planning and Infrastructure and other agencies in relation to the establishment of a comprehensive, adequate and representative reserve system outside the RFA area, through Bush Forever or similar programs.*

3.2. Protocol for Key Performance Indicator 1

3.2.1. Objective of the KPI

The objective of KPI 1 is to assess the success of the implementation of the Forest Management Plan in achieving its targets for representation of forest ecosystems in conservation reserves, through tracking the progress in the establishment of formal reserves.

3.2.2. Rationale

Monitoring the status of implementation of reserve proposals is important to the successful establishment of the comprehensive, adequate and representative (CAR) reserve system. In the past, many proposals for conservation reserves have taken a long time before the process of establishing them is complete. Tracking the process of establishment and dealing with impediments to establishment will assist in the assessment of management activities so that appropriate actions to better achieve the objective can be identified.

3.2.3. Background and context

The establishment of a CAR reserve system is fundamental to the conservation of biodiversity.

The CAR reserve system is comprised of formal reserves, Forest Conservation Areas and some informal reserves. This KPI focuses on the formal reserve component of the CAR reserve system.

The formal conservation reserve system proposed in the Forest Management Plan is based on the National Reserve System principles to select areas to meet CAR criteria and additional reserves as a result of Government policy decisions, most notably the *Protecting our old-growth forests* policy.

The Guidelines for the National Reserve System Program aim for the CAR reserve system to contain samples of all ecosystems identified at an appropriate regional scale. In doing so, the aim is to also consider the ecological requirements of rare or threatened species and ecological communities and ecosystems, special groups of organisms such as those with specialized habitat requirements, wide ranging or migratory species or species vulnerable to threatening processes.

3.2.4. *Issues*

Implementation of the proposed amendments to land category as detailed in the Forest Management Plan is a complex process that may be influenced by other agencies such as the Western Australian Land Information Authority, the Department of Water, the Department of Industry and Resources, and local government authorities. Additionally, the changes require Parliamentary approval. Each of these bodies may have concerns or objections that affect the capacity to achieve the proposed changes, including delays in the process while issues are addressed.

Other causes of delays relate to consideration of the Commonwealth's *Native Title Act 1993* and the State *Land Administration Act 1997* (principally concerning the closure of unwanted roads), and pastoral leases which extend beyond the time frame of the Forest Management Plan.

Mapping of forest ecosystems is only available for land within the Regional Forest Agreement area and outside this area the Beard-Hopkins vegetation associations have been used as a guide to representation of ecosystems in conservation reserves. Forest ecosystem mapping is subject to refinement that may lead to minor variations in the data.

3.2.5. *The entities to be measured for the KPI*

Entity	Target
The area of each land category in the plan area.	No target for plan period. Long-term target is the area of each land category when all proposed land category changes are completed.
The percentage of the total distribution of each forest ecosystems in the Regional Forest Agreement Region of the plan area that occurs in formal conservation reserves, being national parks, nature reserves, conservation parks and CALM Act section 5(1)(g) & (h) reserves.	No target for plan period. Long-term target is the percentage achieved when all proposed land category changes are completed.
The number of individual reserve proposals as set out in Appendix 2 of the Forest Management Plan (286 in total) that have been fully implemented.	Of the total number of proposed changes (286), the nominal target is 70 per cent (200) to be fully implemented by December 2013.

3.2.6. *Required data*

Required data	Collection & storage method	Data Custodians
Current tenure base in the plan area	Obtain from Landgate via Information Management Branch and import to Forest Management Information System prior to the calculation for each reporting period.	Geographic Information Section of Information Management Branch and Forest Management Branch
Proposed tenure base in the plan area	Forest Management Information System attribute	Forest Management Branch
Regional Forest Agreement Region		Forest Management Branch
Forest ecosystems distribution in the plan area		Forest Management Branch
Completion status of proposed land category changes	Status of each proposal to be maintained in a database	Land and External Funding Unit, Parks and Visitor Services Division

3.2.7. *Calculation method*

Entity to be measured	Calculation method
Area of each land category in the plan area	Import updates of the Landgate land base from Information Management Branch to the Forest Management Information System (FMIS) and calculate the area of each land category. Include information on land categories used in the national State of the Forest report and IUCN categories to facilitate reporting for other processes. Aggregate categories into formal conservation reserves and other.
Representation of forest ecosystems in the formal reserve system within the Regional Forest Agreement Region of the plan area	Overlay FMIS attribute "Forest Ecosystem" with the current Landgate land base for the Regional Forest Agreement Region to obtain the area of each forest ecosystem by land category. Amalgamate the area of each ecosystem in categories in the formal reserve system and express as a percentage of the total representation in the region.
The status of each proposal by the stage of implementation	Maintain a register of the status of proposed land category changes (see Appendix 2 of the Forest Management Plan) and express the number completed as a percentage of the total of proposed land category changes (286).

3.2.8. *Measurement, calculation and reporting frequency*

Required metric	Measurement frequency	Calculation frequency
Area (hectares) of each land category in the whole plan area.	Immediately following the close of each two-year reporting period. That is January 2006, 2008, 2010, 2012, and 2014.	January 2006, 2008, 2010, 2012, and 2014.
The percentage representation of each forest ecosystem in the formal conservation reserve system.		
The implementation status of each land category change proposed in Appendix 2 of the Forest Management Plan.	Recording of the implementation status of each proposed land category change as it occurs.	January 2006, 2008, 2010, 2012, and 2014.

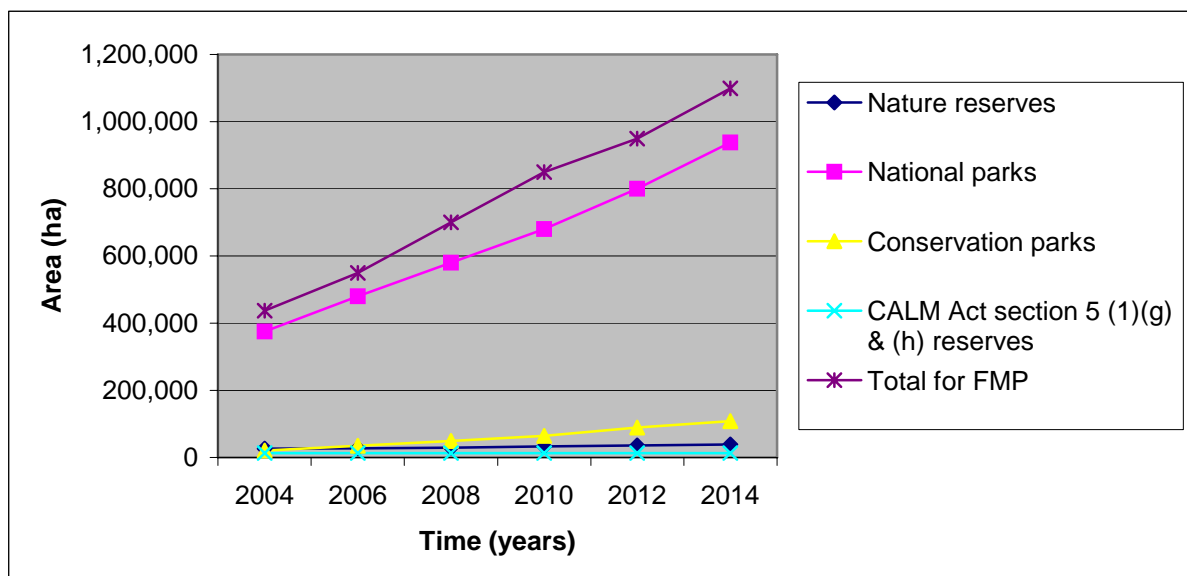
3.2.9. *Data presentation*

Metric	Presentation
Area (hectares) of each land category applicable to formal conservation reserves in the whole plan area.	Amalgamate the area of all land categories that make up the formal conservation reserve system. Present the total area in the formal reserve system as a table (table 1) and a line graph (figure 1) showing the progression at each reporting period toward the total when all proposals are implemented.
The percentage representation of each forest ecosystem in the formal conservation reserve system.	Present as a table (table 2) showing the percentage representation of each forest ecosystem in the formal conservation reserve system at each reporting period and the percentage representation of each forest ecosystem that will occur when all proposed land category changes are fully implemented.
The number of individual land category changes proposed in Appendix 2	Present the number of proposed changes in land category by implementation status graphically with the target for completion highlighted.

Table 1: Area (ha) by established land category for formal conservation reserves in the area of Forest Management Plan for each reporting period.

Land category	Total area (ha) for each reporting period						Total area (ha) in existing formal conservation reserves and proposals in Forest Management Plan
	2004	2006	2008	2010	2012	2014	
Nature reserves	26,870						39,150
National parks	375,490						938,090
Conservation parks	21,350						108,360
CALM Act section 5(1)(g) & (h) reserves.	13,220						13,480
Total	436,930						1,099,080

Figure 1: Area (ha) of established formal conservation reserves by land category in the area of Forest Management Plan for each reporting period.



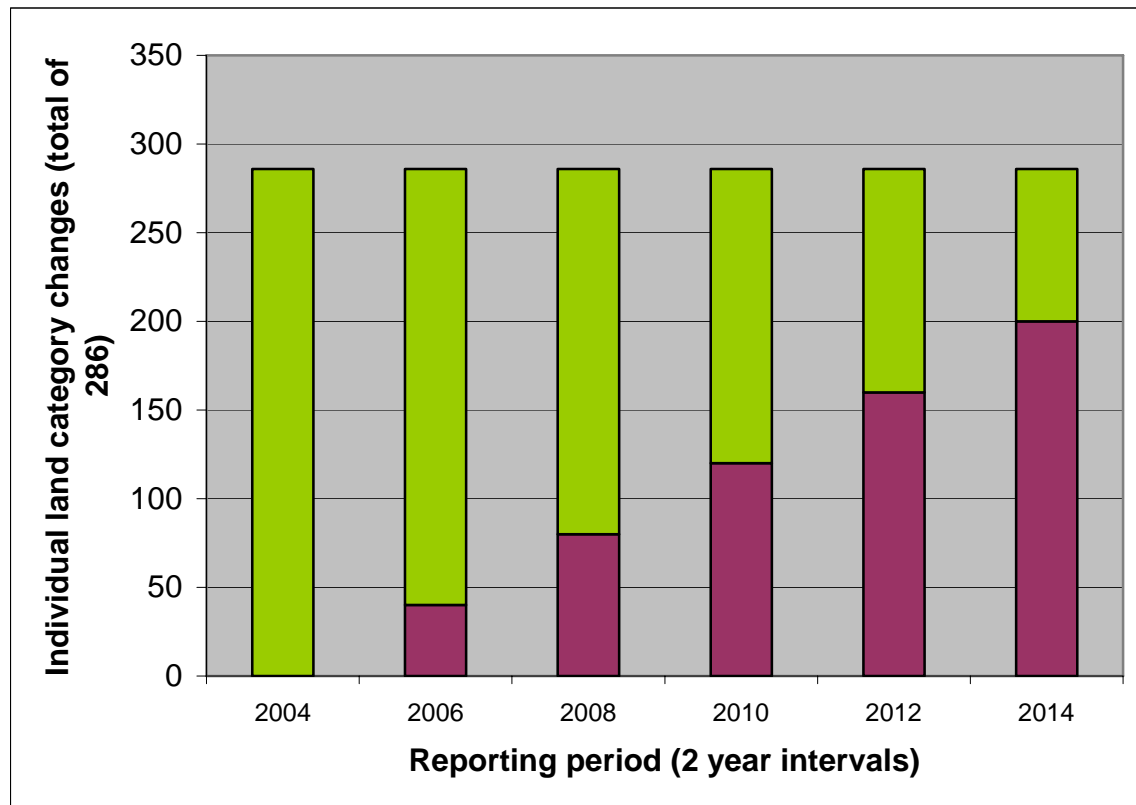
* Arbitrary figures have been used to demonstrate progression for reporting intervals from 2006 to 2012

Table 2: Representation of each forest ecosystem in formal conservation reserves for each reporting period in relation to the percentage that will occur when all reserves are established.

Ecosystem type	Ecosystem representation in formal reserves (percentage of pre 1750 extent)						Ecosystem representation in formal reserves (percentage of pre 1750 extent) as proposed in the Forest Management Plan (Sum of 8 numbers in appendix 8 for each ecosystem, converted to %)	
	2004	2006	2008	2010	2012	2014		
Jarrah dominant								
Jarrah Blackwood	2.4						23.5	(81,510/347,200)
Jarrah Leeuwin	4.6						7.1	(7,910)
Jarrah Mt Lindesay	1.2						14.5	(18,320)
Jarrah North East	4.4						15.5	(111,150)
Jarrah North West	7.7						13.6	(90,870)
Jarrah Rates's Tingle	66.0						77	(1,160)
Jarrah Red Tingle	43.0						65.7	(230)
Jarrah Sandy	8.0						22.4	(24,190)
Jarrah South	9.4						40.2	(223,830)
Jarrah Unicup	6.4						18.6	(15,050)
Jarrah Woodland	11.0						25.8	(27,480)
Jarrah Yellow Tingle	15.3						66.3	(7,690)
Sub total	6.3						21.9	(609,400/2,783,950)
Karri dominant								
Karri Main Belt	19.2						35.8	(69,150)
Karri Rate's Tingle	71.8						71.8	(790)
Karri Red Tingle	68.3						72.6	(5,230)
Karri West Coast	27.0						30.7	(4,450)
Karri Yellow Tingle	15.3						70.6	(11,150)
Sub total	21.2						39.2	(90,770)

Ecosystem type	Ecosystem representation in formal reserves (percentage of pre 1750 extent)						Ecosystem representation in formal reserves (percentage of pre 1750 extent) as proposed in the Forest Management Plan (Sum of 8 numbers in appendix 8 for each ecosystem, converted to %)	
	2004	2006	2008	2010	2012	2014		
<i>Wandoo dominant</i>								
Western Wandoo forest	7.4						17.9	(64,950)
Western Wandoo woodland	8.4						20.5	(33,360)
<i>Sub total</i>	7.7						18.7	(98,310)
<i>Other</i>								
Bullich and Yate	53.9						77.1	(2,160)
Darling Scarp	4.7						7.93	(2,300)
Peppermint and Coastal Heath	66.9						72.3	(57,880)
Rocky Outcrops	17.0						31.4	(8,300)
Sand Dunes	97.8						99.7	(11,070)
Shrub, Herb, and Sedgelands	21.9						49.5	(212,770)
Swamps	33.8						39.9	(6,100)
<i>Sub total</i>	28.8						50.6	(300,600)
<i>Total</i>	10.6						26.6	(1,099,080/4136350)

Figure 2: Number of proposed land category changes that have been fully implemented by reporting period.



	Number of individual land category changes required to reach implementation of all proposed land category changes.
	Number of individual land category changes completed

* The nominal target (70% of total proposals) for completion is shown in 2014 as 200 individual land categories.

* Arbitrary figures have been used to demonstrate progression for reporting intervals from 2006 to 2012

3.2.10. Responsibility

Information Management Branch is responsible for collection of updated data from Landgate.

Forest Management Branch is responsible for:

- collection of data from Information Management Branch;
- input of updated data into Forest Management Information System;
- data collation and analysis for KPI; and
- data presentation and interpretation.

Parks and Visitor Services Division is responsible for maintaining a database of the completion status of proposed land category changes.

Forest Policy and Practices Branch is responsible for collating information for this KPI together with other KPI into a report to the Conservation Commission.

The Conservation Commission is responsible for performance assessment and publication of its report.

4. KPI 2 - The status of (critically endangered, endangered, vulnerable, conservation dependent) forest-dwelling species and ecological communities as determined by listing

4.1. Background information from the Forest Management Plan

The overall objective of the Forest Management Plan in relation to biological diversity is:

The plan proposes the following Actions at the whole of forest scale for the purpose of seeking to conserve biodiversity and seeking to conserve self-sustaining populations of native species and communities, and at the landscape scale for the purpose of seeking to allow for the recovery of biodiversity between one timber rotation and the next. (Forest Management Plan p23)

Forest Management Plan extract (page 30)

<i>Key performance indicator 2</i>	<i>The status of (critically endangered, endangered, vulnerable, conservation dependent) forest-dwelling species and ecological communities as determined by listing.</i>
<i>Performance measure</i>	<i>List of species and ecological communities and their status that tracks movements of species between protection categories.</i>
<i>Performance target(s)</i>	<i>No species or ecological community will move to a higher category of threat as a result of management activities.</i>
<i>Reporting</i>	<i>Annually with the review of the lists.</i>
<i>Response to target shortfall</i>	<i>The Department to investigate the cause of a change to a more threatened category and report to the Conservation Commission and to the Minister for the Environment. The Conservation Commission to evaluate the need for revision of management practices, in the context of its assessment and auditing function, in consultation with the Department.</i>

The objective in relation to threatened species of flora and fauna and ecological communities is:

The plan proposes the following Actions at the landscape scale for the purpose of seeking to protect, and assist the recovery of, threatened and priority species of flora and fauna and ecological communities: (Forest Management Plan p28)

Most relevant Forest Management Plan actions:

- 8.1 *The Department will maintain a list identifying threatened and priority species of flora and fauna and threatened ecological communities. (Threatened species and communities are those under risk of extinction. Priority species and communities are those that may be threatened but for which there are insufficient survey data, and those that are rare but not endangered).*
- 8.2 *The Department and the Forest Products Commission will conduct their operations having regard to the Department's Conservation of Endangered and*

Specially Protected Fauna in the Wild policy and Conservation of Threatened Flora in the Wild policy.

- 8.3 *The Department and Forest Products Commission will revise planning checklists to identify actions to be taken in specified circumstances in which declared rare flora species, threatened ecological communities, and other significant flora identified in Appendix 13 may be disturbed by their operations.*
- 8.4 *The Forest Products Commission and the Department will undertake operations in accordance with guidelines for operations in the presence of fauna, to be developed as part of the Fauna Distribution Information System, which is to be completed by the Forest Products Commission:*
- 8.4.1 *to the satisfaction of the Department; and*
- 8.4.2 *in consultation with the Conservation Commission.*
- 8.5 **(Plantations):** *The Forest Products Commission will advise the Department of its harvesting and management activities within plantations:*
- 8.5.1 *where those activities may impact on threatened species and threatened ecological communities, agreed protection measures is implemented.*
- 8.6 *The Department will develop and implement recovery plans for selected threatened species and ecological communities, including:*
- 8.6.1 *the Western Shield fox baiting program (which seeks to reduce predation pressure on threatened and priority species of fauna).*

4.2. Protocol for Key Performance Indicator 2

4.2.1. Objective of the KPI

The objective of KPI 2 is to assess the success of the implementation of the Forest Management Plan in achieving its targets through monitoring the status (protection category) of threatened flora, fauna and ecological communities, so that ecosystem management activities can be assessed and appropriate actions to better achieve the objective can be identified.

4.2.2. Rationale

Monitoring the status of threatened flora, fauna and ecological communities is essential to identify those taxa and communities at most risk of extinction so that recovery actions can seek to prevent any further loss in biodiversity through an increased level of threat or extinction.

4.2.3. Background and context

The *Wildlife Conservation Act 1950* provides for taxa of native plants (flora) and native animals (fauna) to be specially protected if they are under identifiable threat of extinction. Such specially protected fauna and flora are considered to be "threatened" and are officially listed through a *Wildlife Conservation (Specially Protected Fauna) Notice* or a *Wildlife Conservation (Rare Flora) Notice* in the Government Gazette.

The Threatened Species Scientific Committee meets at least once a year to consider any nominations received since the previous meeting and the public is invited to submit nominations to add taxa to, or delete taxa from, the current Declared Rare Flora and Specially Protected Fauna lists. The Threatened Species Scientific Committee also

make recommendations for change to the World Conservation Union (IUCN) ranking for listed taxa.

The Threatened Species Scientific Committee reports to the Director General of the Department of Environment and Conservation and the Minister for the Environment. Ministerial approval is necessary before changes to the lists are given legal status with the amended rankings accepted and published in a notice in the *Government Gazette*. The Conservation Commission, established under the *Conservation and Land Management Act 1984*, also considers the advice of the Threatened Species Scientific Committee and, make recommendations to the Minister on wildlife conservation policies.

Threatened ecological communities are recognised under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* but not the State *Wildlife Conservation Act 1950*. The proposed Biodiversity Conservation Act is expected to provide this recognition. However, while there is not currently State legislative protection for threatened ecological communities, the *Environmental Protection Act 1986* recognises them and provides a mechanism for protecting them from clearing. The land clearing regulations and the “Bush Forever” program aim to retain all significant remnant vegetation including threatened ecological communities.

The Declared Rare Flora and Specially Protected Fauna lists and the lists of Threatened Ecological Communities endorsed by the Minister is the basis for measurement of the KPI.

4.2.4. Issues

Changes in designated conservation status (critically endangered, endangered, vulnerable, conservation dependent) can be used as a crude indicator of the status of biodiversity.

Some threats to species may be beyond the control of forest managers.

The following issues should be considered in interpreting changes in conservation status:

- whether the change in status is the result of human intervention and management;
- whether the change in status is the result of human activity largely unmanageable by forest managers;
- whether the change in status is the result of natural variations;
- whether the change in status is the result of threats outside of the forest or inside the forest;
- the effectiveness of the nomination and/or assessment of change process in reviewing the threatened species and community lists;
- implementation of agreed actions to manage threats and improve the status of the threatened species; and
- a determination will need to be made as to whether the taxa is forest dwelling. That judgment is made if any part of the life cycle is dependent on forest habitat.

4.2.5. *The entities to be measured for the KPI*

Entity	Target
Threatened forest-dwelling flora	No species will move to a higher category of threat as a result of management activities or lack of appropriate management activities.
Threatened forest-dwelling fauna	
Threatened forest-dwelling ecological communities	No ecological community will move to a higher category of threat as a result of management activities.

4.2.6. *Required data*

Required data	Collection & storage method	Custodians
A list showing categories of threatened taxa of forest-dwelling flora, fauna and ecological communities for the area covered by the Forest Management Plan.	Nature Conservation Division to store state lists and to intersect with area of Forest Management Plan.	Threatened flora – Senior Botanist, Species and Communities Branch. Threatened Fauna- Senior Zoologist, Species and Communities Branch. Threatened ecological communities- Species and Communities Branch.

4.2.7. *Calculation method*

Parameter of measurement	Calculation method
Change in conservation status for threatened taxa and ecological communities.	State-wide lists of threatened taxa and ecological communities to be refined to those taxa and communities that occur in the area of the management plan and for those that are forest-dwelling. Updated lists to be compared on an annual basis by data custodians to identify threatened taxa and ecological communities that have changed conservation status.

4.2.8. *Measurement, calculation and reporting frequency*

Required measurement	Measurement frequency	Calculation frequency
Number of threatened taxa and ecological communities that have changed protection category including current and previous status.	Annual at the end of December.	Calculations to follow endorsement of amended lists by the Minister from the recommendations made by the Threatened Species Scientific Committee.

4.2.9. *Data presentation*

Metric	Presentation
Number of taxa and ecological communities classified in each conservation status for each year of the life of the management plan. The data for flora and fauna is presented in major groups (Fungi, vascular plants etc). The data for ecological communities is presented by community name.	Table showing number in each category as per Table 1 below. Text describing overall patterns of change in number of threatened taxa and communities.
Number of forest-dwelling taxa and ecological communities classified in each conservation status (presumed extinct, critically endangered, endangered, vulnerable, conservation dependent) at the start of the management plan and at the last update of the lists of conservation status within each reporting period.	Table showing number in each category as per Table 2 and 3 below. Text identifying any taxa or community elevated into a greater threat category, as determined by conservation status, and the reasons for this change. Text identifying any taxa or community reclassified to a lower threat category, as determined by conservation status, and the reasons for this change. Text describing any changes as a result of management practices or other causes of elevated or lowered threat.

The information is presented in the following format.

Table 1: Total number of forest-dwelling taxa and ecological communities in the area covered by the Forest Management Plan by conservation status for flora and fauna (presumed extinct, critically endangered, endangered, vulnerable, conservation dependent) and by conservation status for ecological communities (totally destroyed, endangered, vulnerable, critically endangered) for each reporting period.

Taxon	Presumed extinct			Critically endangered			Endangered			Vulnerable			Conservation dependent		
	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year
Flora															
Vascular															
Non-vascular															
Fungi															
Sub-total															
Fauna															
Mammals															
Birds															
Reptiles															
Amphibians															
Invertebrates															
Sub-total															

	Totally destroyed			Critically Endangered			Endangered			Vulnerable		
	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year
Ecological communities												
Total												

An asterisk (*) indicates new additions to the lists that may not relate to management activities.

Table 2: Change in conservation status (presumed extinct, critically endangered, endangered, vulnerable, conservation dependent) of forest-dwelling taxa in the area covered by the Forest Management Plan between the current and the previous reporting period.

Conservation status at Dec 2006	Conservation status at Dec 2005						
		Presumed extinct	Critically Endangered	Endangered	Vulnerable	Conservation dependent	Not listed
Presumed extinct							
Critically endangered							
Endangered							
Vulnerable							
Conservation dependent							
Not listed							

Table 3: Change in conservation status (totally destroyed, endangered, vulnerable, critically endangered) of forest-dwelling ecological communities in the area covered by the Forest Management Plan between between the current and the previous reporting period.

Conservation status at Dec 2006	Conservation status at Dec 2005				
	Totally destroyed	Endangered	Vulnerable	Critically endangered	Not listed
Totally destroyed					
Endangered					
Vulnerable					
Critically endangered					
Not listed					

4.2.10. Responsibilities

Nature Conservation Division is responsible for:

- data collection and management;
- data collation and analysis;
- data presentation and interpretation; and
- preparing lists to describe the results of this KPI.

Forest Policy and Practices Branch is responsible for collating information for this KPI together with other KPI into a report to the Conservation Commission.

The Conservation Commission is responsible for the performance assessment, reviewing and publication of its report.

4.2.11. Work Instructions

1. Geographic Information Services to intercept map of the distribution of threatened taxa and ecological communities in Western Australian with the area of the Forest Management Plan. This is to identify all taxa and ecological communities on the threatened list within the area of the plan.
2. Geographic Information Services to provide lower level intercept to identify all potential *forest dwelling* taxa and ecological communities within Forest Management Plan area.
3. Custodians of the data, Species and Communities Branch to agree on methodology for identifying *forest dwelling* taxa and ecological communities and to develop those lists.
4. Species and Communities Branch to provide updated lists of taxa and ecological communities and to cross match data to identify changes in category or any new additions to the lists. Species and Communities Branch to provide reasons for change in category and provide data to Forest Policy and Practices Branch.
5. Forest Policy and Practices Branch to collate information in report to Conservation Commission.
6. The Conservation Commission to audit and review the report. The Conservation Commission will provide its response to the Minister and publish its report.

5. KPI 3 - The status of selected threatened or conservation dependent species that are the subject of management actions to protect them

5.1. Background information from the Forest Management Plan

The overall objective of the Forest Management Plan in relation to biological diversity is:

The plan proposes the following Actions at the whole of forest scale for the purpose of seeking to conserve biodiversity and seeking to conserve self-sustaining populations of native species and communities, and at the landscape scale for the purpose of seeking to allow for the recovery of biodiversity between one timber rotation and the next. (Forest Management Plan p23)

Forest Management Plan extract (page 31)

<i>Key performance indicator 3</i>	<i>The status of selected threatened or conservation dependent species that are the subject of management actions to protect them.</i>
<i>Performance measure</i>	<i>The trap success for animals at selected monitoring sites.</i>
<i>Performance target(s)</i>	<i>As per recovery plans.</i>
<i>Reporting</i>	<i>Annually.</i>
<i>Response to target shortfall</i>	<i>The Department to investigate the cause and report to the Conservation Commission and to the Minister for the Environment. The Conservation Commission to evaluate the need for revision of management practices in the context of its assessment and auditing function, in consultation with the Department.</i>

The objectives in relation to retention of habitat elements in harvesting operations and threatened and priority species and ecological communities is:

The plan proposes the following Actions at the landscape scale for the purpose of seeking to prevent any species moving to a higher category of threat or, in particular, declining to irretrievably low levels as a result of management actions.

The plan proposes the following Actions at the landscape scale for the purpose of seeking to protect, and assist the recovery of, threatened and priority species of flora and fauna and ecological communities. (Forest Management Plan p28)

Most relevant Forest Management Plan actions:

- 7.1 *The Department will publish a map by 1 January 2004 showing locations of indicative fauna habitat zones.*
- 7.2 *The Department may change the locations and areas of indicative fauna habitat zones in a manner that:*
 - 7.2.1 *has regard to the criteria specified in Appendix 4, where the change occurs prior to the approval of the Guidelines referred to in the following paragraph; and*
 - 7.2.2 *is in accordance with Guidelines for the Selection and Management of Fauna Habitat Zones, which are to be:*

- prepared by the Department with public consultation; and
 - submitted to the Conservation Commission for advice and approved by the Minister for the Environment by 31 December 2004, when they will take effect and supercede Appendix 4.
- 7.3 By 30 June 2004 the Department, in consultation with the Conservation Commission, will complete a review of the location of indicative fauna habitat zones having regard to the criteria specified in Appendix 4, with a view to making appropriate changes to those locations under Action 7.2.1.
- 7.4 The Department and Forest Products Commission will conduct their operations in indicative fauna habitat zones, and in fauna habitat zones established under Appendix 4 and the Guidelines for the Selection and Management of Fauna Habitat Zones:
- 7.4.1 in a manner that has regard to the requirements set out in Appendix 4, where the operation occurs prior to the approval of the Guidelines; and
- 7.4.2 in accordance with the Guidelines after they are approved and supersede Appendix 4.
- 8.1 The Department will maintain a list identifying threatened and priority species of flora and fauna and threatened ecological communities. (Threatened species and communities are those under risk of extinction. Priority species and communities are those that may be threatened but for which there are insufficient survey data, and those that are rare but not endangered).
- 8.2 The Department and the Forest Products Commission will conduct their operations having regard to the Department's Conservation of Endangered and Specially Protected Fauna in the Wild policy and Conservation of Threatened Flora in the Wild policy.
- 8.3 The Department and Forest Products Commission will revise planning checklists to identify actions to be taken in specified circumstances in which declared rare flora species, threatened ecological communities, and other significant flora identified in Appendix 13 may be disturbed by their operations.
- 8.4 The Forest Products Commission and the Department will undertake operations in accordance with guidelines for operations in the presence of fauna, to be developed as part of the Fauna Distribution Information System, which is to be completed by the Forest Products Commission:
- 8.4.1 to the satisfaction of the Department; and
- 8.4.2 in consultation with the Conservation Commission.
- 8.5 **(Plantations):** The Forest Products Commission will advise the Department of its harvesting and management activities within plantations:
- 8.5.1 where those activities may impact on threatened species and threatened ecological communities, agreed protection measures will be implemented.
- 8.6 The Department will develop and implement recovery plans for selected threatened species and ecological communities, including:
- 8.6.1 the Western Shield fox baiting program (which seeks to reduce predation pressure on threatened and priority species of fauna).

5.2. Protocol for Key Performance Indicator 3

5.2.1. Objective of the KPI

The objective of KPI 3 is to assess the success of the implementation of the Forest Management Plan in achieving its targets for conservation of biodiversity through protecting and assisting the recovery of threatened and conservation dependant species of fauna.

5.2.2. Rationale

Monitoring the status of threatened and conservation dependant species of fauna is essential to providing information on the success of measures such as Western Shield and fauna habitat zones designed to mitigate the impact of disturbances such as timber harvesting and fire, in protecting and assisting the recovery of threatened and conservation dependant species of fauna.

5.2.3. Background and context

Over the past 100 years there has been a decline in the population of many Western Australian mammals. The decline has been attributed to a number of major factors: land clearing and the redirection of environmental resources to human populations; reduction in environmental productivity due to the alteration of habitats by introduced grazing animals; altered fire regimes; and direct reduction in populations due to introduced predators and competitors.

Research indicates that native mammals most at risk of being driven to extinction are easy prey—medium-sized animals weighing between 35 grams and 4200 grams. These mammal species have been termed critical weight range (CWR).

A number of actions to control predation by foxes and feral cats have been introduced by the Department as part of the Western Shield program to reverse the declining trend. This includes aerial fox baiting using 1080 poison, captive breeding programs and reintroduction programs for threatened taxa.

Fauna habitat zones are also used as a strategy to meet the Forest Management Plan's objective of ensuring that biodiversity recovers between timber harvest rotations.

Fauna habitat zones provide an extensive network of areas within State forest and timber reserves that are excluded from timber harvesting in the mid-term. The aim is to maintain fauna populations within themselves, and to provide a source for the recolonisation of nearby areas after timber harvesting.

5.2.4. Issues

The following issues should be considered in interpreting changes in populations of selected fauna subject to monitoring:

- whether the change in capture rate is the result of human intervention and management;
- whether the change in capture rate is the result of human activity largely unmanageable by forest managers;
- whether the change in capture rate is the result of natural variations; or

- whether the change in capture rate is the result of threats outside of the forest or inside the forest.

Whilst it is desirable for reporting under this KPI to be based on the same taxa and location over the timeframe of the Forest Management Plan, it may not be possible to achieve this due to factors such as operational limitations resulting in other than annual monitoring and natural events such as wildfire that are beyond the control of the Department.

5.2.5. *The entities to be measured for the KPI*

Entity	Target
Trap success	Increase in, or maintenance of, capture rate (in relation to success criteria as per recovery plans where recovery plans exist)

5.2.6. *Required data*

Required data	Collection & storage method	Custodians
Trap success for selected threatened and conservation dependent species at selected monitoring sites for annual reporting periods.	Species and Communities Branch to arrange, through Regional Services, trapping at selected sites and record capture rate.	Regional fauna conservation officers, Regional Services (initial data collection), and Species and Communities Branch, Nature Conservation Division (data collation and reporting).

5.2.7. *Calculation method*

Entity to be measured	Calculation method
Trap success for selected fauna.	<p>Capture rate (number of animals captured expressed as a percentage of traps) for selected threatened and conservation dependent fauna species at monitoring sites across the Forest Management Plan area.</p> <p>The indicative list of selected fauna will include:</p> <ul style="list-style-type: none"> • Woylie • Brushtail possum • Quenda • Chuditch

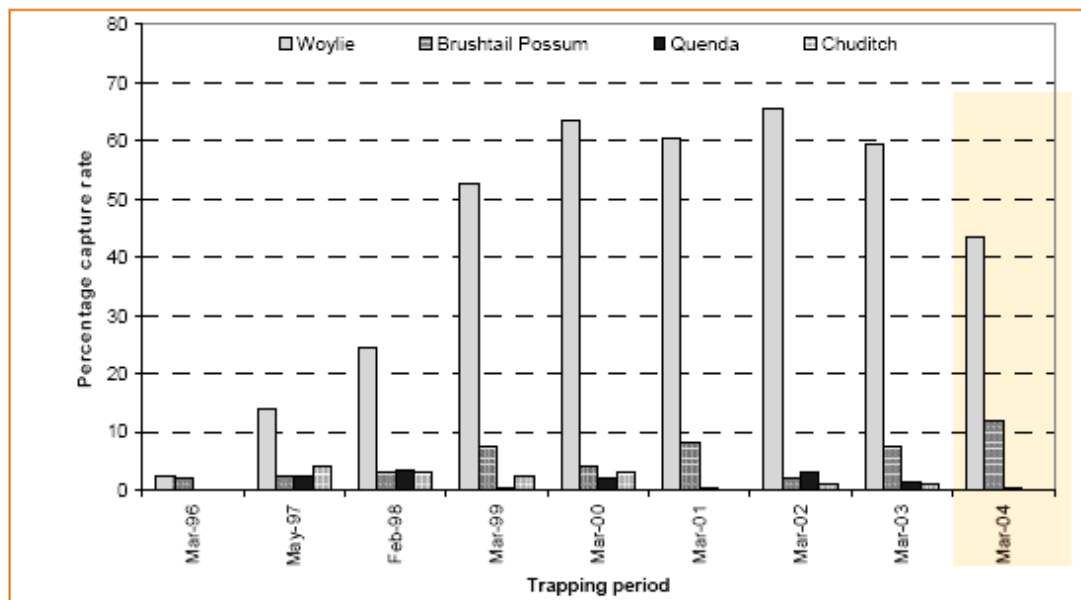
5.2.8. Measurement, calculation and reporting frequency

Required metric	Measurement frequency	Calculation frequency
Capture rate (expressed as a percentage of traps)	Annually subject to availability of data.	Annually

5.2.9. Data presentation

Metric	Presentation
Capture rate (expressed as a percentage of traps)	Data is presented as a column graph (Figure 1) showing capture rate for each trapping period for the life of the plan for selected fauna species at selected sites. Text to describe trends and interpret the success of management actions.

Figure 1. Capture rates for medium sized mammals at a selected monitoring site within the area of the Forest Management Plan. (Note: data in the graph is taken from 2003-2004 CALM Annual Report for the purpose of demonstrating data presentation)



Percentage capture rates of medium-size mammals in Moopinup forest block

5.2.10. Responsibility

Regional Services (respective Regional offices) is responsible for data collection and management of primary data.

Nature Conservation Division (Species and Communities Branch) is responsible for:

- data collection and management;
- data collation and analysis;
- data presentation and interpretation; and
- text to describe data trends.

Forest Policy and Practices Branch is responsible for collating information for this KPI together with other KPI into a report to the Conservation Commission.

The Conservation Commission is responsible for performance assessment and publication of its report.

5.2.11. Further reading

Burbidge, A.A., and N.L. McKenzie (1989). Patterns in the modern decline of Western Australia's vertebrate fauna: causes and conservation implications. *Biological Conservation* **50**: 143-198.

6. KPI 4 - The area of native forest and plantations

6.1. Background information from the Forest Management Plan

The overall objective of the Forest Management Plan in relation to productive capacity is:

The overall aim of the plan is to seek to sustain and, where applicable, enhance the productive capacity of the forest. (Forest Management Plan p32)

Forest Management Plan extract (page 38)

<i>Key performance indicator 4</i>	<i>The area of native forest and plantations.</i>
<i>Performance measure</i>	<i>Change in:</i> <ul style="list-style-type: none"> • <i>the area of native forest and plantations;</i> • <i>area of forest by land category;</i> • <i>area of forest cleared; and</i> • <i>area of forest rehabilitated.</i>
<i>Performance target(s)</i>	<i>No permanent loss of net area of forested land.</i>
<i>Reporting</i>	<i>After each five years.</i>
<i>Response to target shortfall</i>	<i>The Department to investigate the cause and report to the Conservation Commission and to the Minister for the Environment.</i>

The objective in relation to maintaining the area of native forest and plantations is:

The plan proposes the following Actions for the purpose of seeking to maintain the net area of forested land: (Forest Management Plan p32)

Most relevant Forest Management Plan actions:

- 10.1 *The Conservation Commission and the Department will make submissions in relation to development proposals forwarded to them for comment or advice, with a view to:*
- 10.1.1 *seeking to reduce the permanent loss of forested areas as a result of development;*
 - 10.1.2 *seeking the replacement of forested areas permanently lost to development;*
 - 10.1.3 *promoting the construction of infrastructure such as roads, pipelines and other utilities at common locations, such as infrastructure corridors; and*
 - 10.1.4 *reducing the impact of mining and petroleum operations on forested areas with a high productive capacity for timber production.*
- 10.2 *The Department will, where reasonable and practicable, construct roads in a manner and at a location that will service multiple needs.*
- 10.3 *The Department will seek to progressively rehabilitate redundant roads.*
- 10.4 *(Plantations): The Forest Products Commission will maintain the minimum area of plantation estate required to meet State Agreement Act supply requirements by:*
- 10.4.1 *replanting pines in all suitable areas of State forest and freehold (fee simple) land held in the name of the Executive Director that have*

previously been planted with pines and have been clearfelled, except at Gnangara, Peel, Hamel and other areas determined consistently with the agreement ratified under the Wood Processing (Wesfi) Agreement Act 2000; and

10.4.2 establishing new plantations on appropriate cleared land to replace any plantation areas that are clearfelled but not replanted with plantation species.

6.2. Protocol for Key Performance Indicator 4

6.2.1. Objective of the KPI

The objective of KPI 4 is to assess the success of the implementation of the Forest Management Plan in achieving its targets through tracking any change in the area of native forest and plantations.

6.2.2. Rationale

This indicator is helpful as it measures the amount of existing forest area and reveals if that area is increasing or decreasing as a result of management practices. Maintaining the net area of forested land after harvesting, mining and infrastructure is essential for maintaining the productive capacity, and other forest values, and the sustainable flow of benefits from the forests to society. A continual decline in the area of forest is likely to lead to a decline in sustainable yield of timber and impacts on biodiversity and other forest values.

6.2.3. Background and context

The loss of forest area is a major factor in diminishing the productive capacity of the forest. Productive capacity may be diminished as a result of Government decisions that address a broader social need, such as clearing forest for essential infrastructure like major power lines. Performance measurements from KPI 4 will reveal any change in forest areas and facilitate examination of the reasons for these changes.

The Forest Management Plan defines forest as 'An area, incorporating all living and non-living components, that is dominated by trees having usually a single stem and a mature or potentially mature stand height exceeding two metres and with existing or potential crown cover of overstorey strata about equal to or greater than 20 per cent'. The Forest Management Plan defines plantation as 'State forest and timber reserve planted with exotic species'.

6.2.4. Issues

Changes in proposed land category over the period of implementation of the plan may confound measurement of the area of native forest and plantation by land category, so the proposed land category as mapped at January 2004 is used throughout. The ability to accurately measure the area of forest cleared and rehabilitated is limited by data quality provided by proponents to clear forest. Whilst some proponents such as Alcoa Australia provide high quality data at regular intervals, other proponents do not provide any information on cleared areas to the Department.

6.2.5. *The entities to be measured for the KPI*

Entity	Target
The area of native forest and plantations	No permanent loss of net area of forested land.
The area of forest by proposed land category	
The area of forest cleared	
The area of forest rehabilitated	

6.2.6. *Required data*

Required data	Collection & storage method	Custodians
Area of native forest as at December 2003, December 2008 and December 2013	FMIS	Forest Management Branch
Area of plantations as at December 2003, December 2008 and December 2013	FMIS	Forest Products Commission
Land category as at December 2003 as proposed in the Forest Management Plan.		Forest Management Branch
Area of native forest cleared and rehabilitated		Forest Management Branch
Area of plantation cleared and rehabilitated		Forest Products Commission

6.2.7. *Calculation method*

Parameter to be measured	Calculation method
Area of native forest by proposed land category	Intersect native forest data layer with land category data layer in FMIS and have results presented as a two-way table for each date (Dec 2003, Dec 2008, Dec 2013).
Area of plantations by proposed land category	Intersect plantations data layer with land category data layer in FMIS and have results presented as a two-way table for each date (Dec 2003, Dec 2008, Dec 2013).
Change in area of native forest	The change in area of native forest is calculated by subtracting the area of native forest at a particular date from the area of native forest at the preceding date.
Change in area of plantations	The change in area of plantations is calculated by subtracting the area of plantations at a particular date from the area of plantations at the preceding date
Area of native forest cleared	Interrogate the native forest cleared data layer.
Area of plantations cleared	Interrogate the plantations cleared data layer.
Area of native forest rehabilitated	Interrogate the native forest rehabilitated data layer.

Parameter to be measured	Calculation method
Area of plantations rehabilitated	Interrogate the plantations rehabilitated data layer.

6.2.8. *Measurement, calculation and reporting frequency*

Required measurement	Measurement frequency	Calculation frequency
Area of native forest by proposed land category	Yearly	Five yearly
Area of plantations by proposed land category	Yearly	Five yearly
Change of area in native forest	Yearly	Five yearly
Change of area in plantations	Yearly	Five yearly
Area of native forest cleared	Yearly	Five yearly
Area of plantations cleared	Yearly	Five yearly
Area of native forest rehabilitated	Yearly	Five yearly
Area of plantations rehabilitated	Yearly	Five yearly

6.2.9. *Data presentation*

Table 1: Area (ha) of native forest and plantation by land category at December 2003 and December 2008 and the change in area between these dates.

December 2003					
Land Category (including proposals)	Native forest	Plantation	Total forest	Other	Total
State forest, timber reserve or ED land					
National park					
Nature reserve					
Conservation park					
5(1)(g) and (h)					
Total					
December 2008					
Land Category (including proposals)	Native forest	Plantation	Total forest	Other	Total
State forest, timber reserve or					

ED land					
National park					
Nature reserve					
Conservation park					
5(1)(g) and (h)					
Total					
December 2003 – December 2008					
Land Category (including proposals)	Native forest	Plantation	Total forest	Other	Total
State forest, timber reserve or ED land					
National park					
Nature reserve					
Conservation park					
5(1)(g) and (h)					
Total					

Table 2: Area (ha) of forest cleared and rehabilitated over the period December 2003 to December 2008.

	Native forest	Plantation	Total forest	Other	Total
Cleared					
Rehabilitated					

6.2.10. Responsibility

Senior Forester, Forest Management Branch is responsible for:

- archiving the Forest Management Plan proposed land category data layer;
- maintaining the native forest data layer;
- intersecting the native forest and plantations data layers with the land category data layer;
- maintaining the native forest cleared and rehabilitated data layers;
- data analysis and preparation of draft tabular information as shown in section 9 above;
- draft text describing and interpreting changes in the area of native forest and plantations.

Forests Products Commission is responsible for:

- maintaining the plantations data layer; and

- providing a copy of the plantations, plantations cleared and plantations rehabilitated data layers at the end of each calendar year to the Senior Forester, Forest Management Branch.

Forest Policy and Practices Branch is responsible for collating this information together with information from other KPI into a report to the Conservation Commission.

The Conservation Commission is responsible for performance assessment and the publication of its report.

7. KPI 8 - The presence of Sirex in softwood plantations

7.1. Background information from the Forest Management Plan

The overall objective of the Forest Management Plan in relation to productive capacity is:

The overall aim of the plan is to seek to sustain and, where applicable, enhance the productive capacity of the forest. (Forest Management Plan p32)

Forest Management Plan extract (page 40)

<i>Key performance indicator 8</i>	<i>The presence of Sirex in softwood plantations.</i>
<i>Performance measure</i>	<i>Evidence of Sirex in trap trees.</i>
<i>Performance target(s)</i>	<i>No evidence of Sirex in trap trees.</i>
<i>Reporting</i>	<i>Annually.</i>
<i>Response to target shortfall</i>	<i>The Forest Products Commission to initiate a control program.</i>

The objective in relation to weeds pests and diseases is:

The plan proposes the following Actions at the operational scale for the purpose of seeking to reduce the impact of weeds, pests and diseases on the productive capacity of the forest: (Forest Management Plan p36)

Most relevant Forest Management Plan actions:

- 14.1 *In addition to the measures referred to in Action 18.4, the Department will:*
- 14.1.1 *establish a process for the identification and investigation of weed, pest and disease outbreaks that threaten productivity; and*
 - 14.1.2 *where appropriate, prescribe measures in Silviculture Guidelines to limit the impact of weeds, pests and diseases on productivity.*
- 14.2 **(Plantations):** *The Forest Products Commission will:*
- 14.2.1 *maintain an early warning system for Sirex in pine plantations; and*
 - 14.2.2 *monitor weeds, pests and diseases affecting productivity and, where reasonable and practicable, take measures to control them.*

7.2. Protocol for Key Performance Indicator 8

7.2.1. Objective of the KPI

The objective of KPI 8 is to assess the success of the implementation of the Forest Management Plan in achieving its target of not allowing Sirex to become established in plantations, and thus minimising the impact of Sirex on the productive capacity of pine plantations in the plan area.

7.2.2. Rationale

Sirex outbreaks have the potential to seriously reduce the productive capacity of the State's softwood plantations. Early detection of Sirex is vital if biological agents are to be successfully introduced to prevent its spread and minimise damage. Monitoring

undertaken in association with KPI 8 will provide for the early detection of Sirex in softwood plantations so inoculation management plans can be implemented effectively.

7.2.3. Background and context

Sirex noctilio is a woodwasp species native to Europe that infests pine trees. It was accidentally introduced into New Zealand in 1945 and has since been discovered in Australia where outbreaks have been recorded in Tasmania, Victoria, New South Wales and South Australia.

Sirex will normally complete one generation per year. Female wasps deposit eggs (oviposition) and toxic mucus together with a symbiotic dry rot fungus into the bark of the tree. Sirex larvae then feed on the fungus as they tunnel through the wood. The combination of the fungus and the toxic mucus together causes the death of the tree. Adults emerge from December to May and live for only a few days.

Pinus radiata is highly susceptible to Sirex attack. Trees attacked by Sirex begin showing symptoms that include beads of sap on the bark as a result of oviposition and, tree crown colour-changes as the tree is weakened. Crowns will change from green to light green, yellow then redish-brown. Trees that are part of unthinned stands or stressed from wind, fire or logging tend to be more susceptible to attack than healthy trees in well thinned stands.

Biological agents have been introduced to control Sirex with varying success. The parasitic nematode, *Deladenus siricidicolahas* has been highly successful with populations of Sirex collapsing as a result of its introduction. Some parasitic wasps (*parasitoids*) have been introduced including the species *Ibalia*, *Rhyssa*, *Megarhyssa*, and *Schletterarius* and have been moderately effective but their activity alone is not sufficient to quash Sirex outbreaks.

Sirex has been intercepted occasionally in Fremantle and vigilant quarantine has ensured it has not established itself in Western Australia softwood plantations.

7.2.4. The entities to be measured for the KPI

Entity	Target
Presence of Sirex	No evidence of Sirex in trap trees.

7.2.5. Required data

Required data	Collection & storage method	Responsibility
Indicative data for the area of the Forest Management Plan from the establishment of trap trees in <i>Pinus radiata</i> plantations.	A network of trap trees to be established at a sufficient number of locations in <i>Pinus radiata</i> stands. Full monitoring procedures, trap tree preparation and data collection to be undertaken and recorded by FPC's Softwood Silviculturalist.	Forest Products Commission

7.2.6. Calculation method

Entity to be measured	Calculation method
Presence of Sirex in trap trees.	Calculation for KPI reporting requires Yes/No for Sirex detection at all monitored sites.

7.2.7. Measurement, calculation and reporting frequency

Required metric	Measurement frequency	Calculation frequency
Presence of Sirex infestation in trap trees (Yes/No)	Assessment of trap trees for any Sirex infestation to be conducted at periodic intervals between autumn and early winter following the preparation of trap trees between November and December.	Annually

7.2.8. Data presentation

Metric	Presentation
Presence of Sirex infestation in trap trees (Yes/No)	Data to be presented in a table (table 1) including number of plantations assessed, number of trees assessed and number of infested trees. Text to describe the monitoring process and any Sirex infestation if detected in trap trees.

Table 1: Sirex detection in trap tree plots for reporting period 2004-2005.

No. of Plantations Assessed	No. of Trees Assessed	No. of infested Trees

7.2.9. Responsibility

Softwood Silviculturalist, Forest Products Commission is responsible for:

- establishing a network of trap trees to detect Sirex;
- undertaking trap tree poisoning;
- periodic assessment of trap trees;
- data collation and analysis for KPI; and
- data presentation and interpretation.

These procedures to be conducted each year as stipulated in KPI reporting.

Forest Products Commission is responsible for collating information for this KPI together with other KPI that require reporting by FPC into a report to the Conservation Commission.

The Conservation Commission is responsible for performance assessment and publication of its report.

7.2.10. Work Instructions

Stages for establishing a network of detection using trap trees attractive to Sirex.

1. Site Selection for trap trees:

- approximately five trees from unthinned plantations 10-25 years old;
- selected from trees that are under stress from fire, drought/moisture stress and pine needle blight;

- trees that are near to all weather access roads; and
 - trees with poor form to minimise wastage of quality timber.
2. Timing of trap tree poisoning requires injecting herbicide into trap trees mid-November to mid-December to weaken trees and make attractive to Sirex over their peak flight season (January-March).
 3. Poisoning technique requires:
 - selection of appropriate herbicide;
 - tree butts to be made accessible by thoroughly trimming branches; and
 - herbicide to be injected into sapwood (not bark) 20cm from the ground using a tree injector with an injection rate of 2ml of undiluted chemical every 15 cm around the stem.
 4. Assessing results

Trees to be examined during autumn and early winter for:

- signs of stress from herbicide injection;
 - signs of Sirex attack (brown staining of the cambium layer beneath the bark); and
 - identification to be confirmed by Forest Entomologist if infestation is suspected.
5. Results to be recorded for each trap tree as demonstrated in table 2 below.

Table 2: Detection of Sirex in trap tree compartments

	Poison date	Assessment of poison success	Trees infested
Date			
Tree 1		Y/N	N
Tree 2		Y/N	N
Tree 3		Y/N	N
Tree 4		Y/N	Y ⇒ Fell tree and inoculate
Tree 5		Y/N	N

7.2.11. Further reading

Department of Conservation and Land Management Western Australia (1988). Sirex Plan.

National Sirex Coordination Committee (1999). *National Sirex Control Strategy* (Operations Worksheet).

Neumann, F.G, P. Andrew, R. Shepherd, and H. Stewart (1989). Guidelines for the Control of Sirex Wasp in Victoria. Lands and Forest Division, Report to Regional Management.

Neumann, F.G, J.L. Morey, and R.J. McKimm (1987). The Sirex Wasp in Victoria, Lands and Forest Division, Department of Conservation, Forests and Lands.

8. KPI 14 - Access for apiculture

8.1. Background information from the Forest Management Plan

The overall objective of the Forest Management Plan in relation to productive capacity is:

The overall aim of the plan is to seek to sustain and, where applicable, enhance the productive capacity of the forest. (Forest Management Plan p32)

Forest Management Plan extract (page 41)

Key performance indicator 14	Access for apiculture.
Performance measure	The number of registered sites by land category.
Performance target(s)	No target, trends to be reported.
Reporting	Biennially.
Response to target shortfall	The Department to investigate the cause and report to Conservation Commission and to the Minister for the Environment. The Conservation Commission to evaluate the need for revision of management practices in the context of its assessment and auditing function, in consultation with the Department.

The objective in relation to apiary sites is:

The plan proposes the following Actions for the purpose of seeking to manage the removal of forest produce, other than sawlogs and residue logs, in a manner that, so far as is practicable and sustainable, satisfies public demand for that produce: (Forest Management Plan p36)

Most relevant Forest Management Plan actions:

13.1 The Department will:

- 13.1.1 regulate the supply of forest produce, other than sawlogs, residue logs, and craftwood ('other forest produce') through the administration of licensing legislation;
- 13.1.2 maintain and, where appropriate, prepare guidelines for the management of other forest produce that:
 - are to be periodically reviewed, with public consultation, and
 - in the case of new guidelines or revisions to guidelines, are to be submitted to the Conservation Commission for advice and approved by the Minister for the Environment before they take effect;
- 13.1.3 where reasonable and practicable, monitor supply patterns for signs of non sustainability; and
- 13.1.4 facilitate the salvage of forest produce generated by management actions the primary purpose of which is not timber production, or natural events where salvage activities can contribute to rehabilitation and do not significantly increase the level of disturbance or the risk of environmental impacts to the forest area.

8.2. Protocol for Key Performance Indicator 14

8.2.1. Objective of the KPI

The objective of KPI 14 is to assess the success of the implementation of the Forest Management Plan through the management of the production of honey and by providing information on the number of apiculture sites.

8.2.2. Rationale

This KPI measures the number of registered apiary sites in relation to land categories in the area of the Forest Management Plan and provides information on the change in number of sites over time, particularly as a result of area management plans for conservation reserves that prescribe the removal of sites. From this information, management activities can be assessed and appropriate actions to better achieve the objective can be identified.

8.2.3. Background and context

The Department of Conservation and Land Management manages beekeeper access to all Crown land (excluding Commonwealth land) through the *Conservation and Land Management Act 1984* and the *Forest Management Regulations 1993*. Registered apiary sites occur on all types of State managed land.

At September 2004, there were 3046 current apiary site permits on all Crown land tenures throughout the State, including 1633 permits for land vested in the Conservation Commission. Some 75% of the honey resource in the State is located on land vested in the Conservation Commission. Of the 96 beekeepers registered to collect honey from these sites almost 80 of them operate about 1000 registered apiary sites in State forests and timber reserves.

The Beekeeping Consultative Committee was created to facilitate discussion and consultation between the Department, industry groups and other Government agencies on issues that may affect the beekeeping industry. The Committee normally meets twice a year in May and November.

The Beekeeping Consultative Committee provides industry input to DEC on beekeeping matters and consists of representatives from the WA Apiarists' Society, Wescobee Limited, Swan Settlers Limited, WA Farmers' Federation, WA Beekeepers Association, Pollination Association of WA as well as a member from the Department of Land Administration, Water Corporation, Pastoral Lands Board, and Pastoralists and Graziers Association.

Ecological principles suggest that introduced honey-bees adversely affect native plant pollinators through competition for pollen and nectar resources. Research is being undertaken to quantify these effects. It is policy that existing apiary sites in nature reserves, national parks, and conservation parks are retained, except where their removal has been prescribed in an area management plan. The policy also places a moratorium on new site development that will affect those sites in State forest that are now proposed to become a conservation reserve.

The number and distribution of apiary sites is based on land categories at the time of each reporting of the KPI. This will provide for the interpretation of any changes in the number of apiary sites over reporting periods.

8.2.4. Issues

Data for the number of unregistered apiary sites on private land is unknown. There is no requirement for beekeepers to register sites on private land.

8.2.5. The entities to be measured for the KPI

Entity	Target
Number of registered apiary sites in each Crown land category for the area of the Forest Management Plan.	No target, trends to be reported.

8.2.6. Required data

Required data	Collection & storage method	Custodians
Number of registered apiary sites in the area of the Forest Management Plan by land category at the time of each reporting of the KPI.	The apiary site management database is used to store and manage information including the number and location of registered apiary sites. Apiary Sites Officer to update database on an ongoing basis as further data of number and location of apiary sites is forthcoming. Geographic Information Section maintains current land category information for Crown land at any point in time, as provided by Landgate.	Apiary Sites Officer, Parks and Visitor Services Division. Geographic Information Section

8.2.7. Calculation method

Parameter to be measured	Calculation method
Change in number of apiary sites by land category within the area of the Forest Management Plan.	Overlay map of all registered apiary sites in the area of the Forest Management Plan over the map of current land categories at the time of each reporting of the KPI. Enumerate the registered apiary sites in each land category and the total number of apiary sites. . Change in the number of sites in each land category is to be recorded and trends are to be identified.

8.2.8. *Measurement, calculation and reporting frequency*

Required metric	Measurement frequency	Calculation frequency
Number of registered apiary sites by current land category	Biennially	Biennially

8.2.9. *Data presentation*

1. A table showing the number and breakdown of apiary sites into current land categories in the area of the Forest Management Plan. (see Table 1 below)
2. Text interpreting any changes or trends and the reasons for the number and distribution of registered apiary sites in each land category.

Table 1: Number of apiary sites on each land category in the area of Forest Management Plan.

Land category	Number of sites in Forest Management Plan area				
	January 2004	January 2006	January 2008	January 2010	January 2012
State forest, timber reserve					
Nature reserve					
National park					
Conservation park					
CALM Act section 5(1)(g) & (h) reserve					
Total for Forest Management Plan area					

8.2.10. *Responsibilities*

Apiary Sites Officer from Parks and Visitor Services Division is responsible for:

- apiary site data collection and management;
- apiary site data collation and analysis;
- data presentation and analysis; and
- draft text describing and interpreting trends in apiary site number and distribution.

Geographic Information Section is responsible for:

- management of land category information;
- intersection of apiary site data with current land category information; and
- providing the information on number of apiary sites in each land category to the Apiary Sites Officer.

Forest Policy and Practices Branch is responsible for collating this information together with information from other KPI into a report to the Conservation Commission.

The Conservation Commission is responsible for performance assessment and the publication of its report.

8.2.11. Work Instructions

1. Apiary Sites Officer to provide apiary site information for Forest Management Plan area to Geographic Information Section and request intersection with current land category information on a biennial basis.
2. Geographic Information Section to provide the information on number of apiary sites in each land category to the Apiary Sites Officer.
3. Apiary Sites Officer to produce table showing number of apiary sites on each land category in the area of Forest Management Plan (see Table 1)
4. Apiary Sites Officer to interpret changes and trends between biennial reporting periods and over the period of the Plan.

9. KPI 15 - Wildflowers and seed picking

9.1. Background information from the Forest Management Plan

The overall objective of the Forest Management Plan in relation to biological diversity is:

The overall aim of the plan is to seek to sustain and, where applicable, enhance the productive capacity of the forest. (Forest Management Plan p32)

Forest Management Plan extract (page 41)

<i>Key performance indicator 15</i>	<i>Wildflowers and seed picking.</i>
<i>Performance measure</i>	<i>The level of activity measured by picking endorsements and returns.</i>
<i>Performance target(s)</i>	<i>No target, trends to be reported.</i>
<i>Reporting</i>	<i>Annually.</i>
<i>Response to target shortfall</i>	<i>The Department to investigate the cause and report to Conservation Commission and to the Minister for the Environment. The Conservation Commission to evaluate the need for revision of management practices in the context of its assessment and auditing function, in consultation with the Department.</i>

The objective in relation to other forest produce:

The plan proposes the following Actions for the purpose of seeking to manage the removal of forest produce, other than sawlogs and residue logs, in a manner that, so far as is practicable and sustainable, satisfies public demand for that produce: (Forest Management Plan p36)

Most relevant Forest Management Plan actions:

13.1 The Department will:

- 13.1.1 regulate the supply of forest produce, other than sawlogs, residue logs, and craftwood ('other forest produce') through the administration of licensing legislation;
- 13.1.2 maintain and, where appropriate, prepare guidelines for the management of other forest produce that:
 - are to be periodically reviewed, with public consultation, and
 - in the case of new guidelines or revisions to guidelines, are to be submitted to the Conservation Commission for advice and approved by the Minister for the Environment before they take effect;
- 13.1.3 where reasonable and practicable, monitor supply patterns for signs of non-sustainability;
- 13.1.4 facilitate the salvage of forest produce generated by management actions the primary purpose of which is not timber production, or natural events where salvage activities can contribute to rehabilitation and do not significantly increase the level of disturbance or the risk of environmental impacts to the forest area.

9.2. Protocol for Key Performance Indicator 15

9.2.1. Objective of the KPI

The objective of KPI 15 is to assess the success of the implementation of the Forest Management Plan in seeking to sustain the productive capacity of the forest through monitoring the removal of wildflowers and seed.

9.2.2. Rationale

This KPI is useful as it measures the change in the number of wildflower and seed picking licences issued and picking returns in the area of the Forest Management Plan over time. This information will help in the sustainable allocation of wildflower and seed picking licences and the protection of forest values.

9.2.3. Background and context

All native flora is protected under the *Wildlife Conservation Act 1950* and licences are required to harvest protected flora on Crown land. General conditions are placed on harvesting through licences and specific conditions are set for some species to ensure their sustainable harvest. Flora harvesting is monitored in the field and through picker returns. Certain species have specific management programs that entail more intensive control through measures including quotas.

All Crown land in the plan area that is managed by the Department for flora harvesting is vested in the Conservation Commission. Pickers require three-monthly endorsements from the Department to collect flora on land vested in the Conservation Commission. This involves written permission for pickers to operate on lands specified under the CALM Act, or land on which DEC manages flora by agreement with the managing authority or landowner.

Harvesting is not permitted in national parks, nature reserves and conservation parks and is generally not permitted in proposed conservation reserves. The majority of harvesting will take place within State forest, timber reserves and forest conservation areas. Harvesting in informal reserves is considered on a case-by-case basis using a risk-based approach to manage the risk to target species conservation, and threat of dieback and other processes.

9.2.4. Issues

Data stored in the Flora Industry Data Management System (FIDMS) is based on the licences issued to pickers on a yearly basis. It is the number of licences issued rather than the picking endorsements (which may change within in a year) that provide quantifiable data. Licences are attached to the person while endorsements are attached to the licensee.

Data collected from picking returns is only as accurate as the information provided by the licencees. DEC officers suggest that while licencees generally have a good understanding in the field, picking returns are not always filled out accurately. The data serves only as a crude indicator of the level of activity of wildflower and seed picking.

Picking return forms are not always returned by the required date. This might result in a delay in the reporting of this KPI to ensure a comprehensive amount of data is collected.

9.2.5. *The entities to be measured for the KPI*

Entity	Target
Number of wildflower and seed picking licences in the area of the Forest Management Plan and the number of forest blocks where licences have been issued	No targets set, trends to be reported
Wildflower and seed picking returns for area of the Forest Management Plan	

9.2.6. *Required data*

Required data	Collection & storage method	Data custodians
A list showing the number of wildflower and seed picking licences issued within the area of Forest Management Plan	Species and Communities Branch to collect and store data from picking returns in the Department's Flora Industry Data Management System.	Species and Communities Branch
A list showing the number of forest blocks for which licences have been issued		
Number of wildflowers cut by species		
Total weight of seed picked by species		

9.2.7. *Calculation method*

Parameter to be measured	Calculation method
Change in the level of activity of wildflower harvesting and seed collecting over reporting periods for the duration of the Forest Management Plan.	Calculate the total amount of forest blocks harvested, wildflowers cut, weight of seed collected and number of licences issued to establish level of activity. Annual measurements to be compared with data from previous years to establish trends.

9.2.8. *Measurement, calculation and reporting frequency*

Required measurement	Measurement frequency	Calculation frequency
Change in the total number of registered pickers for the area of the Forest Management Plan.	Annually at the end of December.	Calculations to follow annual review of wildflower and seed collecting licences issued and picking returns (when returned, see issues section).
Change in the total number of forest blocks where wildflower and seed picking licences have been issued.		
Change in the total number of stems picked for wildflowers in area of Forest Management Plan by species.		
Change in the total amount of seed collected for area of Forest Management Plan by species.		

9.2.9. *Data presentation*

Metric	Presentation
The total number of stems picked	Data to be presented in a table (table 1) with number of forest blocks harvested, wildflower harvesting licenses issued, number of registered pickers and total number of wildflowers harvested from picking returns (in number of stems) for total area of the Forest Management Plan for annual reporting periods. Text to describe and interpret changes and trends.
The combined weight of seed collected	Data to be presented in a table (table 2) with number of forest blocks harvested, seed collecting licenses issued, number of registered pickers and total weight (kg) of seed collected from picking returns for total area of the Forest Management Plan for annual reporting periods. Text to describe and interpret changes and trends.

Table 1: Forest blocks harvested, wildflower harvesting licenses issued, number of registered pickers and total number of wildflowers harvested from picking returns (in number of stems) for total area of the Forest Management Plan for annual reporting periods

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Number of forest blocks for which wildflower harvesting licenses were issued										
Number of registered wildflower pickers										
Total number of wildflowers harvested (number of stems)										

Table 2: Forest blocks harvested, seed collecting licenses issued, number of registered pickers and total weight (kg) of seed collected from picking returns for total area of the Forest Management Plan for annual reporting periods.

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Number of forest blocks for which seed collecting licenses were issued										
Number of registered seed collectors										
Total amount of seed collected (kg)										

9.2.10. Responsibility

Flora Industry Botanist from Species and Communities Branch is responsible for:

- data collection and management;
- data collation and analysis;
- data presentation and analysis; and
- draft text describing and interpreting changes and trends in wildflower and seed harvesting (see work instruction).

Forest Policy and Practices Branch is responsible for collating this information together with information from other KPI into a report to the Conservation Commission.

The Conservation Commission is responsible for performance assessment and the publication of its report.

9.2.11. Work Instructions

Flora Industry Botanist to collate information from FIDMS and present for each District the number of forest blocks harvested, number of stems picked and amount of seed collected by species (see example for Blackwood District in Table 3 and table 4). This information is used to assist interpretation of the more general information that is presented for this KPI (see section 9 above).

Table 3: Wildflower harvesting in Blackwood District for annual reporting periods.

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Number of forest blocks harvested for which wildflower harvesting licenses were issued										
Number of registered pickers										
Total number of wildflowers harvested by species (number of stems)										

Table 4: Seed collecting in Blackwood District for annual reporting periods

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Number of forest blocks for which seed collecting licenses were issued										
Number of registered seed collectors										
Total amount of seed collected by species (kg)										

10. KPI 20 - Percentage of water bodies (e.g. stream kilometres, lake hectares) with significant variance of biodiversity from the historic range of variability

10.1. Background information from the Forest Management Plan

The overall objective of the Forest Management Plan in relation to soil and water is:

An overall aim of the plan is to seek to protect soil and water resources on land to which the plan applies. (Forest Management Plan p48)

Forest Management Plan extract (page 50)

<i>Key performance indicator 20</i>	<i>Percentage of water bodies (e.g. stream kilometres, lake hectares) with significant variance of biodiversity from the historic range of variability.</i>
<i>Performance measure</i>	<i>The diversity of aquatic macro-invertebrate fauna at a selected number of monitoring sites.</i>
<i>Performance target(s)</i>	<i>No sites with fauna significantly different from the reference condition.</i>
<i>Reporting</i>	<i>Every five years.</i>
<i>Response to target shortfall</i>	<i>The Department to investigate the cause and report to the Conservation Commission and to the Minister for the Environment. The Conservation Commission to evaluate the need for revision of management practices in the context of its assessment and auditing function, in consultation with the Department.</i>

The objective in relation to water is:

The plan proposes the following Actions at the operational scale for the purpose of seeking to protect the ecological integrity and quality of streams, wetlands and their associated vegetation, and increase the flow of water to surface and groundwater reservoirs (Forest Management Plan p49)

Most relevant Forest Management Plan actions:

- 21.1 *The Department and the Forest Products Commission will conduct their operations:*
- 21.1.1 *in a manner that has regard to the provisions for stream zones in Appendix 3 where the operation occurs prior to the approval of the Guidelines referred to in the following paragraph; and*
 - 21.1.2 *in accordance with the Guidelines for the Management of Informal Reserves referred to in Action 3.1.2 and the Soil and Water Conservation Guidelines referred to in Action 20.1.2.*
- 21.2 *The Department will review the extent and condition of public access ways leading to public water catchment areas, with a view to considering whether the number of access ways ought to be reduced or their condition improved.*

- 21.3 *The Department and the Forest Products Commission, in consultation with the Conservation Commission, will evaluate with the Water Corporation and the Water and Rivers Commission any proposal seeking to employ silvicultural treatments to increase the flow of water to surface and groundwater reservoirs.*
- 21.4 *The Department:*
- 21.4.1 *will provide advice and assistance to bodies seeking access to the potential sub-surface aquifers and surface reservoirs located on land to which the plan applies;*
 - 21.4.2 *will facilitate access to land to which the plan applies for the purposes of water extraction and the development of associated infrastructure for public water supply purposes where this is consistent with the CALM Act;*
 - 21.4.3 *will take and use water sustainably from land to which the plan applies;*
 - 21.4.4 *may issue permits, after consultation with the Conservation Commission, for the sustainable taking of water from land to which the plan applies; and*
 - 21.4.5 *will assist the Conservation Commission to develop a policy to provide guidance when proposals to take water from land to which the plan applies are considered.*
- 21.5 **(Plantations):** *The Forest Products Commission will:*
- 21.5.1 *conduct its plantation operations in a manner that is in accordance with guidelines for water protection in the Code of Practice for Timber Plantations and the relevant plantation manual, which is revised in consultation with the Department by 31 December 2005;*
 - 21.5.2 *consult with the Water and Rivers Commission prior to undertaking plantation operations in a public water catchment area; and*
 - 21.5.3 *evaluate with the Department, the Water Corporation and the Water and Rivers Commission any proposal seeking to employ silvicultural treatment to increase the flow of water to surface and groundwater reservoirs.*

10.2. Protocol for Key Performance Indicator 20

10.2.1. Objective of the KPI

The objective of KPI 20 is to assess the success of the implementation of the Forest Management Plan in achieving its targets in regard to protecting the ecological integrity and quality of streams.

10.2.2. Rationale

Monitoring the response of animals to their aquatic environment provides a useful measure of the health of streams. This measure is important in providing information on the ecological condition of streams so that potential environmental impacts such as salinity and turbidity can be monitored and if necessary better managed.

10.2.3. Background and context

Biomonitoring assesses the response of plants and animals to any change in their environment. Biomonitoring is widely regarded as a better and more direct indicator of the health of a river or stream than chemical measurements.

In 1994 the Commonwealth Government funded CALM to set up a biomonitoring program for rivers and streams in Western Australia as part of AUSRIVAS (Australian Rivers Assessment Scheme). The program was run by the Department and assisted by some of the State's universities. The program was set up in three stages.

Stage 1 (sample collection) involved collecting samples of macro-invertebrate communities from rivers and streams across Western Australia.

Stage 2 (computer modelling) involved the development of models using the samples collected. Environmental descriptors such as geographical position, seasonality of flow, annual discharge and the position of the monitoring site along the stream were used to determine the environmental characteristics of sites. The computer models were developed using macro-invertebrate communities with similar environmental characteristics to create models for three habitat zones: channel habitat, streambed habitat and macrophyte habitat. This modelling allows for the prediction of expected macro-invertebrate numbers (reference condition).

Stage 3 (model validation) involved an assessment of the validity of the ecological rating provided by the biomonitoring models. The accuracy assessment provided a percentage error rate for the biomonitoring models from the results of a number of tested sites. The percentage error rate was low (<10%) for pristine or minimally disturbed river and stream sites and higher for disturbed sites.

The measurements for this KPI is based on the development of the models for pristine streams that will provide a comparative benchmark on which to judge the degree of disturbance in streams subject to monitoring under this KPI.

10.2.4. *The entities to be measured for the KPI*

Entity	Target
Aquatic macro-invertebrate diversity	No sites with fauna significantly different from the reference condition.

10.2.5. *Required data*

Required data	Collection & storage method	Custodians
List of monitoring sites for measuring aquatic macro- invertebrate diversity.	List to be selected from: a) sites subject to timber harvesting and other disturbances in their catchments; and b) sites that fall within the plan area.	Science Division
Reference condition for selected monitoring sites.	The reference condition is the expected condition of a river or stream according to biomonitoring models developed by the Department (see background section)	Science Division
Aquatic macro-invertebrates collected from selected monitoring sites	Science Division to conduct assessment of sites prior to mid-term and final reporting and record aquatic macro-invertebrates collected.	Science Division

10.2.6. Calculation method

Entity to be measured	Calculation method
Aquatic macro-invertebrates observed and expected (O/E score)	O/E score: Observed macro-invertebrates score divided by expected macro-invertebrates based on pristine stream condition for each monitoring site where the expected macro-invertebrate score is the reference condition.
Ecological rating	An ecological rating of undisturbed, marginally disturbed, or disturbed is assigned to each monitoring site on the basis of the O/E score.

10.2.7. Measurement, calculation and reporting frequency

Required metric	Measurement frequency	Calculation frequency
Aquatic macro-invertebrates O/E score	Annual for selected sites	Five-yearly
Ecological rating		

10.2.8. Data presentation

Metric	Presentation
Aquatic macro-invertebrates O/E score and ecological rating	Data is presented in a table (table 1) showing O/E score for macro-invertebrates based on pristine stream condition for each monitoring site and ecological rating with text to describe trends and provide analysis for sites where there is a significant difference from the reference condition.

Table 1: Aquatic macro-invertebrates observed over expected score (O/E) and ecological rating at selected monitoring sites based on pristine streams within the area of the Forest Management Plan.

	Observed divided by expected score based on pristine stream condition	Ecological rating (undisturbed, marginally disturbed or disturbed)
Site 1		
Site 2		
Site 3		
Site 4		
Site 5		
Site 6		
Site 7		
Site 8		
Site 9		
Site 10		

10.2.9. Responsibility

Science Division is responsible for:

- data collection and management from selected monitoring sites;
- data collation and analysis;
- presentation of the data; and
- interpretation of data and text to explain trends.

Forest Policy and Practices Branch is responsible for collating information for this KPI together with other KPI into a report to the Conservation Commission.

The Conservation Commission is responsible for performance assessment and the publication of its report.

10.2.10. Further reading

Halse, S.A., D.J. Cale, E.J. Jasinska, and R.J. Shiel (2002). Monitoring change in aquatic invertebrate biodiversity: sample size, faunal elements and analytical methods. *Aquatic Ecology* **36**: 395-410.

Smith, M.J., W.R. Kay, D.H.D. Edward, P.J. Papas, K.St.J. Richardson, J.C. Simpson, A.M. Pinder, D.J. Cale, P.H.J. Horwitz, J.A. Davis, F.H. Yung, R.H. Norris, and S.A. Halse (1999). AusRivAS: using macroinvertebrates to assess ecological condition of rivers in Western Australia. *Freshwater Biology* **41**: 269-282.

Smith, M., W. Kay, A. Pinder, and S. Halse (1997). Spineless indicators. *Landscape* **12(3)**: 49-53.

11. KPI 21 - The level of soil damage resulting from timber harvesting

11.1. Background information from the Forest Management Plan

The overall objective of the Forest Management Plan in relation to soil and water is:

An overall aim of the plan is to seek to protect soil and water resources on land to which the plan applies. (Forest Management Plan p48)

Forest Management Plan extract (page 51)

<i>Key performance indicator 21</i>	<i>The level of soil damage resulting from timber harvesting.</i>
<i>Performance measure</i>	<i>Soil damage by risk category as measured by survey.</i>
<i>Performance target(s)</i>	<i>Soil damage not to exceed prescribed maximum levels (see Appendix 6).</i>
<i>Reporting</i>	<i>Annually.</i>
<i>Response to target shortfall</i>	<i>The Department to investigate the cause and report to the Conservation Commission and to the Minister for the Environment. The Conservation Commission to evaluate the need for revision of management practices in the context of its assessment and auditing function, in consultation with the Department.</i>

The objective in relation to soil damage is:

The plan proposes the following Actions at the operational scale for the purpose of seeking to reduce soil damage: (Forest Management Plan p48)

Most relevant Forest Management Plan actions:

- 20.1 *The Forest Products Commission and the Department will conduct their operations involving the use of heavy machinery in a manner that:*
- 20.1.1 *has regard to the requirements of Appendix 6 where the operation occurs prior to the approval of the Guidelines referred to in the following paragraph; and*
- 20.1.2 *is in accordance with the Soil and Water Conservation Guidelines which are to:*
- *be prepared by the Department with public consultation;*
 - *provide for the manner in which the requirements of Appendix 6 are to be met; and*
 - *be submitted to the Conservation Commission for advice and approved by the Minister for the Environment by 31 December 2005, when they will take effect and supercede Appendix 6.*
- 20.2 *The Department and the Conservation Commission will review the operation of the implementation of Appendix 6 and any Guidelines approved under Action 20.1.2, 12 months after the commencement of the plan.*
- 20.3 *The Department will investigate the development of a soil hazard assessment system to help planning to protect soil from damage.*

- 20.4 *The Forest Products Commission and the Department will rehabilitate soil damaged in the course of their operations by:*
- 20.4.1 *identifying and mapping damaged soil; and*
 - 20.4.2 *undertaking rehabilitation work as soon as is reasonable and practicable after the completion of the operation.*

20.5 **(Plantations):** *The Forest Products Commission will:*

- 20.5.1 *conduct its plantation operations in a manner that is in accordance with guidelines for soil protection in the Code of Practice for Timber Plantations and the relevant plantation manual, which is revised in consultation with the Department by 31 December 2005; and*
- 20.5.2 *rehabilitate damaged soil resulting from plantations operations to the standards specified in the Code of Practice for Timber Plantations and the relevant plantation manual.*

11.2. Protocol for Key Performance Indicator 21

11.2.1. Objective of the KPI

The objective of KPI 21 is to assess the success of the implementation of the Forest Management Plan in achieving its targets by providing information on the amount of soil damage as a result of timber harvesting.

11.2.2. Rationale

The use of heavy vehicles, such as those used in timber harvesting operations, can damage forest soils and it may take decades or longer for the soils to recover. The Forest Management Plan incorporates a preventative approach to soil damage. The information will contribute to continuous improvement in the use of heavy vehicles so that future soil damage is minimised.

11.2.3. Background and context

Formal surveys of soil disturbance are required to be undertaken in areas subjected to timber harvesting operations. Formal surveys of soil disturbance are carried out along several transects which are distributed across the harvested cell and laid out at right angles to the general direction of the snig tracks. The soil disturbance is visually assessed over a small area (a 20 cm diameter circle) at one metre intervals along each transect.

The assessment of soil disturbance is based on the visual evidence of soil and litter movement and mixing, and the soil horizon that is involved in the disturbance. Light disturbance typically involves disturbance of the litter layer. Moderate disturbance typically involves disturbance of the topsoil, and severe disturbance involves the subsoil. Visual soil disturbance indicators are shown in table 1 below. A detailed description of the assessment and survey procedures is given in the *Interim Manual of Procedures for the Management of Soils Associated With Timber Harvesting in Native Forests* (CALM, 2005).

Table 1: Visual soil disturbance indicators for moderate, severe and very severe soil disturbance.

Soil disturbance category	Description
Moderate visible soil disturbance	Moderately disturbed, characterised by the topsoil mixed with subsoil or the topsoil partially removed
Severe visible soil disturbance	Severely disturbed, characterised by the topsoil completely removed and subsoil exposed or the topsoil mixed with subsoil, or the subsoil disturbed, or subsoil mixed with parent material, or the subsoil partially removed
Very severe visible soil disturbance	Very severely disturbed, characterised by the subsoil removed and parent material exposed or mixed with subsoil parent material

11.2.4. Issues

There are potentially many surveys conducted over the duration of harvesting a feller's block. If this is the case then the last survey for each coupe becomes the "performance measure" that is entered into the survey records. Survey methods have developed over the first two years of plan implementation so a consistent methodology providing comparable results that would readily identify trends is not yet available.

11.2.5. The entities to be measured for the KPI are:

Entity	Target
Soil damage for each soil disturbance risk category.	Soil disturbance to stay within permissible disturbance levels.

11.2.6. Required data

Required data	Collection & storage method	Responsibility
Number of feller's blocks that exceed the prescribed maximum limits (according to Appendix 6 of the Forest Management Plan)	Forest Products Commission and DEC staff to undertake formal visual surveys of soil disturbance at prescribed intervals in areas where timber harvesting is active. Staff to conduct surveys according to the requirements of the <i>Interim Manual of Procedures for the Management of Soils Associated With Timber Harvesting in Native Forests</i> and forward to DEC Regional SFM Coordinators. The <i>Soil and Water Conservation Guidelines</i> , being developed under the Forest Management Plan, will replace the <i>Interim Manual of Procedures for the Management of Soils Associated With Timber Harvesting in Native Forests</i> .	Monitoring to be undertaken by trained officer in both FPC and DEC.

11.2.7. Calculation method

Entity to be measured	Calculation method
Feller's blocks exceeding allowable limits in each risk period for each harvest type.	Total number of feller's blocks that exceed allowable limits to be recorded and calculated as a percentage of the total number of surveys completed for each harvest type in each risk period. Full survey results to be summarised in Table 3 (shown in work instructions section) before being refined to Table 2 (shown in presentation section) as required for KPI reporting.

11.2.8. Measurement, calculation and reporting frequency

Required metric	Measurement frequency	Calculation frequency
Percentage of feller's blocks exceeding allowable limits in each risk periods for each harvest type.	Soil disturbance surveys to be undertaken as required by the <i>Interim Manual of Procedures for the Management of Soils Associated With Timber Harvesting in Native Forests</i> .	Annually, following the collation of surveys completed.

11.2.9. Data presentation

Metric	Presentation
Percentage of feller's blocks exceeding allowable limits in each risk period for each harvest type	Data is presented in table format (table 2) to document the percentage of feller's blocks that exceed prescribed soil disturbance limits in each risk period, for each harvest type. Text to analyse data and describe trends.

Table 2: Soil damage in each risk period as at reporting period 2004.

Harvest type		Moderate disturbance	Severe disturbance	Very severe disturbance	Landings	Rutting
		Percentage of feller's blocks exceeding allowable limit	Percentage of feller's blocks exceeding allowable limit	Percentage of feller's blocks exceeding allowable limit	Percentage of feller's blocks exceeding allowable limit	Percentage of feller's blocks exceeding allowable limit
High risk	jarrah	5.6%	0%			
	karri thinning					
	<i>karri pre-logging</i>					
	<i>karri clearfall (including pre-logging)</i>					
	<i>Sub-total</i>					
Medium high risk	jarrah	0%	0%			
	karri thinning					
	<i>karri pre-logging</i>					
	<i>karri clearfall (including pre-logging)</i>					
	<i>Sub-total</i>					
Medium risk	jarrah	0%	0%			
	karri thinning					
	<i>karri pre-logging</i>					
	<i>karri clearfall (including pre-logging)</i>					
	<i>Sub-total</i>					
Total						

11.2.10. Responsibility

The Forest Products Commission is responsible for:

- conducting surveys in feller's blocks; and
- forwarding survey results to the appropriate DEC Regional Coordinator for Sustainable Forest Management.

Regional Coordinators for Sustainable Forest Management are responsible for:

- seeing that DEC officers conduct surveys in feller's blocks;
- storage and maintenance of survey data;
- collation of data into tables for reporting; and
- forwarding of data to Forest Policy and Practices Branch prior to annual reporting.

Forest Policy and Practices Branch is responsible for:

- data presentation and analysis;
- drafting text describing and interpreting trends; and
- collating this information together with information from other KPI into a report to the Conservation Commission.

The Conservation Commission is responsible for performance assessment and the publication of its report.

11.2.11. Work Instructions

Information from monitoring is to be collated in the following format to assist interpretation.

Table 3: Soil damage in high-risk, medium-high risk and medium risk categories.

	Harvest type	Moderate disturbance		Severe visible disturbance		Very severe disturbance		Landings		Rutting	
		Allowable limit (% of feller's block)	Percentage of feller's blocks exceeding limit	Allowable limit (% of feller's block)	Percentage of feller's blocks exceeding limits	Allowable limit (% of feller's block)	Percentage of feller's blocks exceeding limits	Allowable limit (% of feller's block)	Percentage of feller's blocks exceeding limits	Allowable limit for rutting=150 mm maximum depth for gravel and sand soils, 300 mm maximum depth for other soils; depths not to be exceeded over 20m length of feeder snig tracks.	Percentage of feller's blocks exceeding limits
High risk	jarrah	8	1/18=5.6%	2	0/18=0%	0		1.5	0/1=0%		
	karri thinning	8	0/28=0%	1	0/28=0%	0		1			
	karri pre-logging	5		1				N/A			
	karri clearfall (including pre-logging)	15	8	2	8	0		3.5	2/2=100%		
	Sub-total										
Medium high risk	jarrah	8	0/16=0%	2	0/16=0%	0		1.5	0/1=0%		
	karri thinning	8	0/20=0%	1	0/20=0%	0		1			
	karri pre-logging	5		1		0		N/A			

	karri clearfall (including pre-logging)	15	18	2	18			3.5	1/1=100%		
	Sub-total										
Medium risk	jarrah	8	0/15=0%	2	0/15=0%	0		1.5			
	karri thinning	8	0/6=0%	1	0/6=0%	0		1			
	karri pre-logging	5		2		0		N/A			
	karri clearfall (including pre-logging)	15	8	N/A	8	N/A		3.5			
	Sub-total										
Total											

12. KPI 23 - The identification and protection of cultural heritage

12.1. Background information from the Forest Management Plan

The overall objective of the Forest Management Plan in relation to natural and cultural heritage is:

An overall aim of the plan is to seek to maintain natural and cultural heritage. (Forest Management Plan p54)

Forest Management Plan extract (page 55)

<i>Key performance indicator 23</i>	<i>The identification and protection of cultural heritage.</i>
<i>Performance measure</i>	<i>The number of existing and new heritage sites identified in management planning and the number protected.</i>
<i>Performance target(s)</i>	<i>No disturbance of a registered place without formal approval.</i>
<i>Reporting</i>	<i>Annually.</i>
<i>Response to target shortfall</i>	<i>The Department or the Forest Products Commission to investigate the cause and report to the Conservation Commission and in the case of the Department, to the Minister for the Environment. The Conservation Commission to evaluate the need for revision of management practices in the context of its assessment and auditing function, in consultation with the Department.</i>

The objective in relation to natural and other cultural heritage is:

The plan proposes the following Actions at the operational scale for the purpose of seeking to identify, record, assess and manage places of natural and cultural heritage significance on land to which the plan applies: (Forest Management Plan p54)

Most relevant Forest Management Plan actions:

25.1 *The Department will:*

25.1.1 *maintain and, where reasonable and practicable, enhance databases of cultural heritage places and values; and*

25.1.2 *cooperate with Commonwealth and State agencies, local government authorities and non-statutory organisations in relation to cultural heritage identification and conservation.*

25.2 *The Department and the Forest Products Commission will conduct their operations in a manner that has regard to the Indigenous Heritage Management Guidelines and Non-Indigenous Heritage Management Guidelines after those Guidelines have been prepared.*

25.3 **(Plantations):** *The Forest Products Commission will:*

25.3.1 *undertake its operations in a manner that is in accordance with guidelines in the Code of Practice for Timber Plantations and the relevant plantation manual for the identification of significant heritage sites, which are to be revised in consultation with the Department; and*

25.3.2 *share information relating to identified heritage sites with the Department.*

12.2. Protocol for Key Performance Indicator 23

12.2.1. Objective of the KPI

The objective of KPI 23 is to assess the success of the implementation of the Forest Management Plan in achieving its targets by providing information on registered heritage sites identified in management planning and the adequacy of their protection during disturbance operations.

12.2.2. Rationale

The performance measure for KPI 23 will help ensure the identification of heritage sites in operations planning so that the assessment and management of those sites can prevent any unauthorized loss as a result of disturbance operations.

12.2.3. Background and context

Indigenous Heritage

The Department of Indigenous Affairs maintains a list of indigenous heritage sites in Western Australia as part of the "Aboriginal Site Register". DEC and the Department of Indigenous Affairs have an agreement where DEC receives monthly updates of listed sites through the Information Management Branch where the data is mapped. A yearly snapshot of indigenous sites is available through Data Druid and monthly updates can be sought through Information Management Branch.

Non-indigenous Cultural Heritage

The RATIS Cultural Heritage Database and the associated User's Manual form part of the hierarchy of DEC processes to identify and protect non-indigenous cultural heritage values. Other databases that need to be accessed are the National Heritage List, Register of the National Estate, WA Register of Heritage Places and the Municipal Inventory for the local Shire. These databases assist proponents of disturbance operations to ensure that places on DEC-managed lands and waters with cultural heritage value are identified, and the information about them is available for use in the planning and management processes for disturbance operations.

The Pre-Operations Checklist is being revised to address a wide range of disturbance operations. This checklist requires the proponent to consider the range of heritage lists and information sources, and should ensure that cultural heritage values are identified early in the operational planning process. The checklist also requires that appropriate management actions to conserve or protect the values are identified and that approval to disturb a heritage place is a recognized requirement.

12.2.4. *The entities to be measured for the KPI*

Entity	Target
Registered indigenous heritage sites identified within the area of proposed operations.	No disturbance of a registered place without formal approval.
Registered non-indigenous cultural heritage sites within the area of proposed operations.	

12.2.5. *Required data*

Required data	Collection & storage method	Custodians
The location of indigenous heritage sites that are listed in the "Register of Aboriginal sites" for the area of the Forest Management Plan.	List of registered indigenous sites are collected from the Department of Indigenous Affairs' "Aboriginal Site Register" and stored in Departmental database. A yearly snap shot is taken of all registered sites on DEC-managed lands and is available on Data Druid. However the Aboriginal Sites Register is updated on a monthly basis and newly registered sites are available through the Database Administrator, Information Management Branch.	Database Administrator, Information Management Branch
The location of non-indigenous cultural heritage sites in the area of the Forest Management Plan.	RATIS Cultural Heritage Database, World Heritage List, National Heritage List, Register of the National Estate, WA Register of Heritage Places and the Municipal Inventory for the local Shire.	Research and Information Management Section of Parks and Visitor Services Division for RATIS, Commonwealth Department of Environment and Water Resources, WA Heritage Council and local Shires.

12.2.6. *Calculation method*

Parameter to be measured	Calculation method
Number of registered indigenous sites identified prior to disturbance operation.	Proponent of disturbance operation is to identify any sites registered within an area where operations are proposed. Regional staff to maintain a register of sites identified by proponents within operational areas.
Number of registered non-indigenous heritage sites identified prior to forest operation.	Proponent of disturbance operation is to identify any sites registered within an area where operations are proposed. Regional staff to maintain a register of sites identified by proponents within operational areas.

Parameter to be measured	Calculation method
Number of registered sites that were not disturbed.	Regional staff from DEC to keep record of identified sites that have not been disturbed during disturbance operations.
Number of registered sites disturbed with formal approval.	Regional staff from DEC to keep records of sites that have been disturbed (with formal approval) during disturbance operations.
Number of registered sites disturbed without formal approval.	Regional staff from DEC to keep records of sites that have been disturbed (without formal approval) during disturbance operations.

12.2.7. Measurement, calculation and reporting frequency

Required metric	Measurement frequency	Calculation frequency
Number of registered indigenous sites identified.	Annually	Annually
Number of registered non-indigenous cultural heritage sites identified.		
Number of registered sites that were not disturbed.		
Number of registered sites disturbed with formal approval.		
Number of registered sites disturbed without approval.		

12.2.8. Data presentation

Metric	Presentation
Number of sites identified, not disturbed or disturbed.	Data is presented in a table (table 1) and will include: <ul style="list-style-type: none"> • number of registered indigenous sites identified; • number of registered non-indigenous cultural heritage sites identified; • number of registered heritage sites avoided; • number of registered heritage sites disturbed with formal approval; and • number of registered heritage sites disturbed without formal approval.

Table 1: Disturbance of heritage sites on DEC-managed lands for 2004.

	Indigenous sites identified in planning for disturbance operations	Non-indigenous cultural heritage sites identified in planning for disturbance operations	Registered heritage sites that were not disturbed	Registered heritage sites disturbed with formal approval	Registered heritage sites disturbed without formal approval
Disturbance operations managed by DEC					
Disturbance operations managed by FPC					
Disturbance operations managed by other proponents					
Total					

12.2.9. Responsibility

Proponents of disturbance operations on DEC-managed lands are responsible for identifying any sites registered within an area where disturbance operations are proposed.

Regional staff from DEC are responsible for:

- maintaining a register of sites identified within proposed disturbance operations, and whether the site was not disturbed, disturbed with formal approval or disturbed without formal approval;
- additional information about any sites disturbed without formal approval; and
- forwarding the above information to Forest Policy and Practices Branch for annual reporting.

Database Administrator, Information Management Branch is responsible for:

- maintaining and updating the Aboriginal Sites Register as maintained for use by DEC officers; and
- providing information to regional staff from DEC and the Forest Products Commission on request of any updates to the Aboriginal Sites Register.

Research and Information Management Section of Parks and Visitor Services Division is responsible for maintaining the RATIS database.

External custodians are responsible for management of the following heritage databases:

- World Heritage Register (Commonwealth Department of Environment and Water Resources);

- Aboriginal Sites Register (Department of Indigenous Affairs);
- National Heritage List (Commonwealth Department of Environment and Water Resources);
- Register of the National Estate (Commonwealth Department of Environment and Water Resources);
- WA Register of Heritage Places (WA Heritage Council); and
- Municipal Inventory for the local Shire (local Shire).

Forest Policy and Practices Branch is responsible for:

- data collation;
- data presentation and interpretation; and
- collation of information for this KPI together with other KPI into a report to the Conservation Commission.

The Conservation Commission is responsible for performance assessment and publication of its report.

12.2.10. Further reading

State Forest of New South Wales (2000) Environmental and Social Values Report 1999/2000.

13. KPI 24 - Consultation and involvement of Aboriginal people in forest management

13.1. Background information from the Forest Management Plan

The overall objective of the Forest Management Plan in relation to natural and cultural heritage is:

An overall aim of the plan is to seek to maintain natural and cultural heritage. (Forest Management Plan p54)

Forest Management Plan extract (page 55)

<i>Key performance indicator 24</i>	<i>Consultation and involvement of Aboriginal people in forest management.</i>
<i>Performance measure</i>	<i>Establishment of the Nyoongar working group. Issues addressed by the Nyoongar working group. Statutory referrals required under native title legislation.</i>
<i>Performance target(s)</i>	<i>Nyoongar working group to be established by 31 December 2004. All statutory referrals made.</i>
<i>Reporting</i>	<i>Annually.</i>
<i>Response to target shortfall</i>	<i>The Department or the Forest Products Commission to investigate the cause and report to the Conservation Commission and in the case of the Department, to the Minister for the Environment. The Conservation Commission to evaluate the need for revision of management practices in the context of its assessment and auditing function, in consultation with the Department.</i>

The objective in relation to Aboriginal heritage is:

The plan proposes the following Actions at the operational scale for the purpose of seeking to work with Aboriginal people to identify, interpret, protect, and manage significant cultural heritage sites: (Forest Management Plan p54)

Most relevant Forest Management Plan actions:

24.1 The Department will:

- 24.1.1 *seek to establish a formal Nyoongar consultative working group to advise on issues relating to Aboriginal cultural heritage in the plan area;*
- 24.1.2 *identify Nyoongar women and men with authority and knowledge relating to Aboriginal cultural heritage in the plan area, and provide for their involvement in the management of the forest; and*
- 24.1.3 *facilitate cross-cultural awareness and interpretive activities to inform and educate the wider community regarding Aboriginal culture.*

13.2. Protocol for Key Performance Indicator 24

13.2.1. Objective of the KPI

The objective of KPI 24 is to assess the success of the implementation of the Forest Management Plan through monitoring progress towards the establishment and performance of the Nyoongar working group.

13.2.2. Rationale

Working and consulting with Aboriginal people will help to continue the practicing of traditional cultures on lands in the area of the Forest Management Plan. Establishment of a Nyoongar working group will assist in the effectiveness of this consultation to meet indigenous heritage requirements under the terms of the Forest Management Plan.

13.2.3. Background and context

Heritage in forests includes Aboriginal and non-Aboriginal cultural values and natural values. The plan provides for the management of the range of heritage values. Management and interpretation of Aboriginal cultural heritage is carried out jointly with Aboriginal people.

Progress towards establishment of the Nyoongar working group involves:

- contacting the Southwest Land and Sea Council to initiate process;
- liaising with the Southwest Land and Sea Council regarding suitable nominations and potential committee members, and terms of reference for the Nyoongar working group;
- contacting those people nominated as committee members for the Nyoongar working group; and
- establish administrative structure for the Nyoongar working group.

13.2.4. The entities to be measured for the KPI

Entity	Target
Establishment of the Nyoongar working group.	Nyoongar working group to be established by 31 December 2004.
Issues addressed by the Nyoongar working group.	No target
Statutory referrals required under native title legislation.	All statutory referrals made.

13.2.5. Performance target

The performance target for the KPI (*Issues addressed by the Nyoongar working group, and Statutory referrals required under native title legislation*) can be addressed once the Nyoongar working group has been established and the administrative processes put in place. The presentation for the KPI will consist of a list of:

- all issues addressed by the Nyoongar working group annually; and
- the number of statutory referrals made annually.

13.2.6. Responsibility

Parks and Visitor Services Division is responsible for collection and collation of the information on this KPI.

Forest Policy and Practices Branch is responsible for collating this information together with information from other KPI into a report to the Conservation Commission.

The Conservation Commission is responsible for performance assessment and the publication of its report.

14. KPI 25 - The protection of heritage places through representation in reserves

14.1. Background information from the Forest Management Plan

The overall objective of the Forest Management Plan in relation to natural and cultural heritage is:

An overall aim of the plan is to seek to maintain natural and cultural heritage. (Forest Management Plan p54)

Forest Management Plan extract (page 56)

<i>Key performance indicator 25</i>	<i>The protection of heritage places through representation in reserves.</i>
<i>Performance measure</i>	<i>Representation of heritage values in the existing and proposed formal and informal reserve system.</i>
<i>Performance target(s)</i>	<i>The Department and the Conservation Commission to complete all actions for which they are responsible in order to formally change the land category of areas proposed for the reserve system within 10 years after the commencement of the plan.</i>
<i>Reporting</i>	<i>Biennially on progress.</i>
<i>Response to target shortfall</i>	<i>The Department to investigate the lack of progress and report to the Conservation Commission and to the Minister for the Environment. The Department to address those impediments within its control and the Department and the Conservation Commission to advise the Minister for the Environment on measures to address other impediments.</i>

The objective in relation to natural and other cultural heritage is:

The plan proposes the following Actions at the operational scale for the purpose of seeking to identify, record, assess and manage places of natural and cultural heritage significance on land to which the plan applies: (Forest Management Plan p54)

Most relevant Forest Management Plan actions:

25.1 *The Department will:*

25.1.1 *maintain and, where reasonable and practicable, enhance databases of cultural heritage places and values; and*

25.1.2 *cooperate with Commonwealth and State agencies, local government authorities and non-statutory organisations in relation to cultural heritage identification and conservation.*

25.2 *The Department and the Forest Products Commission will conduct their operations in a manner that has regard to the Indigenous Heritage Management Guidelines and Non-Indigenous Heritage Management Guidelines after those Guidelines have been prepared.*

25.3 **(Plantations):** *The Forest Products Commission will:*

25.3.1 *undertake its operations in a manner that is in accordance with guidelines in the Code of Practice for Timber Plantations and the relevant plantation manual for the identification of significant heritage sites, which are to be revised in consultation with the Department; and*

25.3.2 *share information relating to identified heritage sites with the Department.*

14.2. Protocol for Key Performance Indicator 25

14.2.1. Objective of the KPI.

The objective of KPI 25 is to assess the success of the implementation of the Forest Management Plan in achieving its targets for the protection of heritage places/sites in the conservation reserve system.

14.2.2. Rationale

The inclusion of a heritage place in the conservation reserve system is likely to improve its protection status.

14.2.3. Background and context

Heritage comprises the things we value and want to keep as a community and as a culture. It includes indigenous and non-indigenous cultural values and natural values. The Forest Management Plan provides for the management of the range of heritage values.

Indigenous heritage

Sacred sites are an integral part of Aboriginal Culture. There is also a rich lore, traditions and the ongoing use of and care for country. There are approximately 23,000 sacred sites registered in Western Australia. A number of these sites are situated within the area of the Forest Management Plan and belong to the Nyoongar people of south-west Western Australia. A register of these sites is maintained by the Department of Indigenous Affairs. This register is periodically updated and the information is provided to DEC.

Cultural heritage

European exploration and colonisation of Western Australia has brought with it a wealth of cultural heritage. In the south-west there is evidence of past activities including timber towns, sawmills, transport systems, dams and weirs, tree nurseries, buildings, structures and other sites. There is also a rich folklore, traditions and the ongoing use and care for the land and forests.

Natural heritage

Natural heritage values include old-growth forest; representative vegetation; natural landscapes; rare, threatened or restricted flora and fauna; forest communities; remnant vegetation; important wetlands; species richness; refugia and centres of endemism; flora at the limit of their range; and geological heritage. The Commonwealth *Australian Heritage Council Act 2003* provides a register and process for the identification and listing of these places.

14.2.4. Issues

The protection of heritage places/sites through their representation in reserves requires the location details for each place/site so they can be overlaid with land category. Not all heritage places registered in the RATIS database have location coordinates attached. The process of registering coordinates to heritage places is currently being undertaken. This will have an impact on the amount of data available for presentation for this KPI particularly through the early stages of the Plan.

14.2.5. The entities to be measured for the KPI

Entity	Target
Number of heritage places/sites in the conservation reserve system.	Formally change the land category of areas proposed for the conservation reserve system within 10 years after the commencement of the plan to increase the level of representation of heritage places in the conservation reserve system.

14.2.6. Required data

Required data	Collection & storage method	Custodians
Number of heritage places/sites in area of Forest Management Plan in existing land categories for biennial reporting periods.	Number of heritage places from "Register of Aboriginal Sites," State "Register of Heritage Places," "National Register of Heritage Places" and RATIS (Recreation And Tourism Information System).	Department of Indigenous Affairs, Western Australia Heritage Council, Australian Heritage Council, Parks and Visitor Services Division and Information Management Branch.

14.2.7. Calculation method

Parameter to be measured	Calculation method
Change in the number of heritage places/sites over time in the formal and informal reserve system.	Intersect Register of Aboriginal Sites, National Register of Heritage Places, State Register of Heritage Places and RATIS with the gazetted area of the formal conservation reserve system, Forest Conservation Area's and the informal reserve system. Assess representation of heritage places in the conservation reserve system over biennial reporting periods.

14.2.8. *Measurement, calculation and reporting frequency*

Required metric	Measurement frequency	Calculation frequency
Number of heritage places/sites in the conservation reserve system as at biennial reporting periods.	Biennially	Biennially

14.2.9. Data presentation

	The representation of heritage places in the conservation reserve system													
	December 2004		December 2006		December 2008		December 2010		December 2012		December 2014		Target	
Land category	No of places/ site	% of target	No of places/ site	% of target	No of places/ site	% of target	No of places/ site	% of target	No of places/ site	% of target	No of places/ site	% of target	No of places/ site	% of target
Formal reserves														
Forest Conservation Areas														
Informal Reserves														
Total														

14.2.10. *Responsibility*

Geographic Information Section of Information Management Branch is responsible for:

- obtaining updated information on a biennial basis from the Register of Aboriginal Sites, (DEC receives monthly updates of this list from the Department of Indigenous Affairs. This is done through a contract with the Geographic Information Section of the Information Management Branch), State Register of Heritage Places, National Register of Heritage Places and RATIS.
- overlaying updated information on heritage places/sites with the formal and informal reserve system biennially; and
- presenting results in a table (see table 1).

Forest Policy and Practices Branch is responsible for collating this information together with information from other KPI into a report to the Conservation Commission.

The Conservation Commission is responsible for performance assessment and the publication of its report.

15. KPI 26 - Number, range and use of recreation/tourism activities available by proposed land category in the plan area

15.1. Background information from the Forest Management Plan

The overall objective of the Forest Management Plan in relation to socio-economic benefits is:

An overall aim of the plan is to seek to sustain and enhance socio-economic benefits obtained from the forest to meet community needs. (Forest Management Plan p57)

Forest Management Plan extract (page 60)

<i>Key performance indicator 26</i>	<i>Number, range and use of recreation/tourism activities available by proposed land category in the plan area.</i>
<i>Performance measure</i>	<i>Type and number of recreation and tourism facilities available in the plan area (e.g. picnic sites, campsites, toilets, visitor centres, walking trails, or major tourism developments). The number of visits to selected recreation areas. The satisfaction visitors express with their experience.</i>
<i>Performance target(s)</i>	<i>Visitor satisfaction maintained at high levels.</i>
<i>Reporting</i>	<i>Annually.</i>
<i>Response to target shortfall</i>	<i>The Department to investigate the cause and report to the Conservation Commission and to the Minister for the Environment. The Conservation Commission to evaluate the need for revision of management practices in the context of its assessment and auditing function, in consultation with the Department.</i>

The objective in relation to recreation and tourism is:

The plan proposes the following Actions at the whole of forest scale for the purpose of seeking to provide opportunities for active and passive recreation and tourism that will meet public demand, so far as is practicable and sustainable, and provide regional economic benefits (Forest Management Plan p57)

Most relevant Forest Management Plan actions:

26.1 The Department will:

- 26.1.1 prepare, in consultation with the Conservation Commission, and progressively implement a strategic framework plan for recreation and tourism on land to which the plan applies;*
- 26.1.2 issue and administer licences, leases and permits for commercial tourism uses in accordance with the provisions of the CALM Act;*
- 26.1.3 issue permits and take other action to enable organised non-commercial recreation and educational groups to undertake appropriate activities;*
- 26.1.4 undertake research in relation to the knowledge, attitudes, skills and activities of visitors to land to which the plan applies; and*
- 26.1.5 where appropriate, provide designated areas where camping may take place or where dogs and horses may be taken.*

15.2. Protocol for Key Performance Indicator 26

15.2.1. Objective of the KPI

The objective of KPI 26 is to assess the success of the implementation of the Forest Management Plan in achieving its targets through the provision of recreational opportunities and tourism.

15.2.2. Rationale

This indicator is important for monitoring the provision of recreation and tourism facilities by the Department and, will help determine whether the range and quality of those facilities are being maintained or improved as a result of management practices.

15.2.3. Background and context

Expanding the range of visitor facilities within the south-west region is anticipated to encourage visitors to stay longer and spend more, thereby increasing the economic benefits associated with nature-based tourism. Some of the new facilities being developed include the Karri Tingle Visitor Centre in the Walpole-Nornalup National Park, as well as a number of tourist drives and private sector low impact accommodation developments.

Departmental Policy Statement No. 18 'Recreation, tourism and visitor services' (1991) and operational guidelines prescribe visitor services provided by the Department. Programs are implemented by Departmental regions and districts based on a five-year strategic plan, and two-year business plans. Visitor services are funded through recurrent and capital budget allocations to the three regions, and through the retention of park entrance, camping, lease and licence fees.

15.2.4. The entities to be measured for the KPI

Entity	Target
Type and number of recreation and tourism facilities	No target
Number of visits to selected recreation/tourism areas	
Level of visitor satisfaction	Maintained or increase level of visitor satisfaction.

15.2.5. *Required data*

Required data	Collection & storage method	Custodians
Type of recreation and tourism facilities for the area of the Forest Management Plan.	Data collect by district staff and stored in Recreation and Tourism Information System (RATIS).	Relevant district staff and Research & Information Management Section of Parks and Visitor Services Division.
Number of recreation and tourism facilities for the area of Forest Management Plan.		
The number of visits to selected recreation sites for the area of Forest Management Plan.		
Visitor satisfaction level for managed recreation sites for the area of the Forest Management Plan.		

15.2.6. *Calculation method*

Parameter to be measured	Calculation method
Type of recreation and tourism facilities for the area of the Forest Management Plan.	Recreational facilities to be aggregated into approximately 10 type categories. RATIS database administrator to refine list of facilities in each type category by proposed land category for annual reporting periods.
Number of recreation and tourism facilities for the area of the Forest Management Plan.	Total number of recreational facilities provided by the Department in proposed land categories.
Number of visits to selected recreation areas for each proposed land category.	Number of visits to selected recreational areas provided by the Department for proposed land categories.
Mean level of visitor satisfaction for the area of Forest Management Plan.	Visitor satisfaction surveys are conducted as part of annual reporting requirements. RATIS Database Administrator to collate survey results of all sites within the Forest Management Plan and calculate mean visitor satisfaction levels over annual reporting periods.

15.2.7. *Parameter to be measured, calculation and reporting frequency*

Required metric	Measurement frequency	Calculation frequency
Type of recreation and tourism facilities provided by the Department as at annual reporting periods.	Annually	Calculation to follow annual updates of RATIS.
Number of existing recreation and tourism facilities provided by the Department as at annual reporting periods.		
Number of visits to selected recreation areas for each proposed land category.		
Mean level of visitor satisfaction over annual reporting periods.		

15.2.8. *Data presentation*

Metric	Presentation
Type and number of facilities provided by the Department.	Type and number of recreation and tourism facilities by proposed land category for the area of the Forest Management Plan as at annual reporting periods (table 1). Text to explain changes and trends in data.
Number of visits to selected recreation areas.	Number of visits to selected recreation areas by proposed land category for the area of the Forest Management Plan as at annual reporting periods (table 2). Text to explain changes and trends in data.
Mean level of visitor satisfaction.	Mean level of visitor satisfaction expressed for all recreation and tourism facilities to be presented as a line graph (figure 1) for the area of the Forest Management Plan over annual reporting periods.

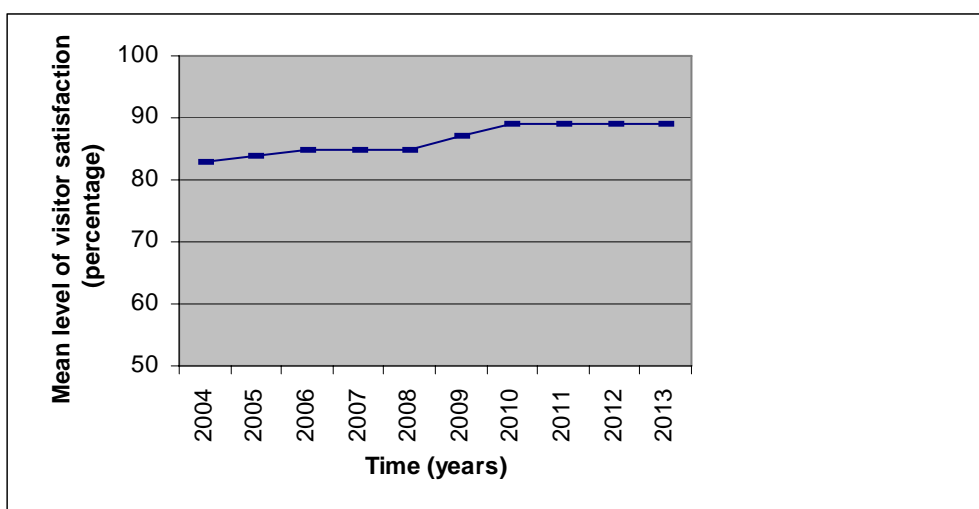
Table 1: Type and number of recreation and tourism facilities by proposed land category for the area of the Forest Management Plan as at annual reporting period 2004.

Proposed land category	Number of recreation facilities for each type of recreational facility							
	Type 1	Type 2	Type 3	Type 4	Type 5	Type 6	Type 7	Type 8
National park								
Nature reserve								
Conservation park								
State forest, timber reserve								
CALM Act section 5 (1)(g) & (h) reserves								
Total								

Table 2: Number of visits to selected recreation areas by proposed land category for the area of the Forest Management Plan over the period 2004 to 2006.

Recreation area	2004	2005	2006
1			
2			
3			
4			
5			
6			
7			

Figure 1: Mean level of visitor satisfaction for managed recreation/tourism sites for the area of the Forest Management Plan over annual reporting periods.



* Arbitrary figures have been used to demonstrate data presentation

15.2.9. *Responsibility*

District staff are responsible for collecting and entering of relevant information from recreation and tourism sites.

Research & Information Management Section of Parks and Visitor Services Division is responsible for:

- updating and maintaining RATIS Database with information;
- collation and analysis of data;
- data presentation and analysis; and
- draft text describing and interpreting trends.

Forest Policy and Practices Branch is responsible for collating this information together with information from other KPI into a report to the Conservation Commission.

The Conservation Commission is responsible for performance assessment and the publication of its report.

16. KPI 27 - Basic raw material supply

16.1. Background information from the Forest Management Plan

The overall objective of the Forest Management Plan in relation to socio-economic benefits is:

An overall aim of the plan is to seek to sustain and enhance socio-economic benefits obtained from the forest to meet community needs. (Forest Management Plan p57)

Forest Management Plan extract (page 60)

<i>Key performance indicator 27</i>	<i>Basic raw material supply.</i>
<i>Performance measure</i>	<i>The number of notices of entry served to the Department under the Local Government Act.</i>
<i>Performance target(s)</i>	<i>No target, trends to be reported.</i>
<i>Reporting</i>	<i>Annually.</i>

The objective in relation to basic raw material supply is:

The plan proposes the following Actions at the whole of forest scale for the purpose of seeking to manage basic raw materials (BRM) and promote the rehabilitation of areas to which the plan applies where BRM have been extracted: (Forest Management Plan p59)

Most relevant Forest Management Plan actions:

- 29.1 *The Department will extract and use gravel and other BRM required for the management of land to which the plan applies.*
- 29.2 *The Conservation Commission will review its policy on BRM extraction as a matter of priority.*
- 29.3 *The Department will make submissions in relation to proposals to extract basic raw materials on land to which the plan applies that are forwarded to it for comment or advice, with a view to seeking:*
 - 29.3.1 *to have the cost of rehabilitation of areas from which BRM are extracted borne by the organisation responsible for the extraction of those materials; and*
 - 29.3.2 *the lodgment of a rehabilitation performance bond.*
- 29.4 *The Department and the Forest Products Commission will maintain a database of areas from which BRM have been extracted and will progressively develop plans and works programs for the rehabilitation of these areas.*

16.2. Protocol for Key Performance Indicator 24

16.2.1. Objective of the KPI

The objective of KPI 27 is to assess the success of the implementation of the Forest Management Plan through the supply of basic raw materials.

16.2.2. *Rationale*

This KPI is important for monitoring the supply of basic raw materials (BRM) from DEC-managed lands. The information will assist in the sustainable allocation of notices of intended entry through an annual review process that will determine quantities being extracted and set acceptable levels and targets for each region.

16.2.3. *Background and context*

Under the *Local Government Act 1995 (LG Act)* basic raw materials may be removed by a local government or Main Roads Western Australia (MRWA) for road maintenance or construction requirements from any land. The material that may be removed includes earth, sand, stone and gravel.

The appropriate legal mechanism for local governments or MRWA to secure access for the purpose of extracting and removing gravel from land managed by the Department is through the service on the Department of a 'notice of intended entry' (NOE) under sections 3.27 and 3.32 of the *LG Act*. Draft Policy Statement No. 2 (Part 1 of 2) Access to Basic Raw Materials from State Forest and Timber Reserves, and Draft Policy Statement NO. 2 (Part 2 of 2) – Access to Basic Raw Materials From The Conservation Estate are currently under review and will cover the new legislative requirements.

Consistent with CALM Policy No 2, gravel and other basic raw materials are made available to local government and MRWA free of charge, for road works that service the Department's management objectives for up to 5 km from State forest (or timber reserve) boundaries unless other reasonable alternatives are available.

Access to basic raw materials from conservation estate will only be granted where the road or facility is within the boundaries of the reserve/park (ie forms an enclave within the reserve/park) and where the use of that BRM provides access for the protection and management of the reserve/park and provided that a more environmentally acceptable alternative is not available. All other conservation estate is managed by referral to the Conservation Commission. Any applications for BRM extraction need to be processed according to Draft Policy Statement 2 (Part 2 of 2).

Regional Managers have the authority to enter into an agreement with the local government/MRWA with conditions for entry if local government/MRWA serves a notice of entry under sections 3.27 and 3.32 of the *LG Act*.

16.2.4. *Issues*

There is no pre-existing centralized management system or database that records the information required to facilitate reporting on this KPI.

16.2.5. *The entities to be measured for the KPI*

Entity	Target
Notices of intended entry.	No target, trends to be reported.

16.2.6. *Required data*

Required data	Collection & storage method	Custodians
A list of all notices of intended entry served to the Department for the area of the Forest Management Plan for each annual reporting period.	Information from notices of intended entry schedules to be collected for Swan, Southwest and Warren Regions. This information to be forwarded on request to Environmental Management Branch and stored in lists ready for annual reporting.	Swan, Southwest, and Warren Regions, Environmental Management Branch of Nature Conservation Division.

16.2.7. *Calculation method*

Parameter to be measured	Calculation method
Number of notices of intended entry served to the Department over annual reporting periods	Sum of notices of intended entry for area of Forest Management Plan and, sum of notices of intended entry for existing and proposed formal conservation reserves for each reporting period.
Number of notices of intended entry served to the Department in existing and proposed formal conservation reserves over annual reporting periods	

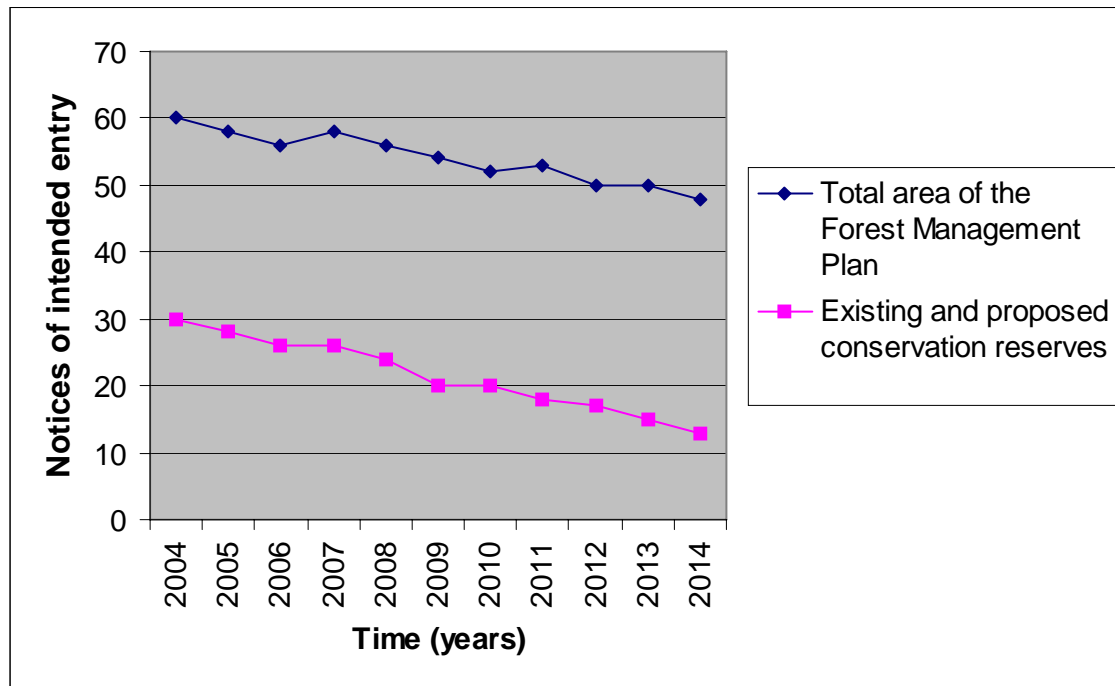
16.2.8. *Measurement, calculation and reporting frequency*

Required metric	Measurement frequency	Calculation frequency
Number of notices of intended entry.	Annually	Annually

16.2.9. *Data presentation*

Metric	Presentation
Number of notices of intended entry served to the Department for total area of the Forest Management Plan.	Data to be presented as a line graph (figure 1) to demonstrate change in the number of notices of intended entry served to the Department over annual reporting periods. Text to describe any change or trends over annual reporting periods (see work instruction section).
Number of notices of intended entry served to the Department in existing and proposed formal conservation reserves.	

Figure 1: Trends in the number of notices of entry served to the Department for the extraction of basic raw materials over annual reporting periods.



* Arbitrary figures have been used to demonstrate data presentation

16.2.10. Responsibility

Southwest, Swan and Warren Regions are responsible for collection and storage of relevant information from the schedule attached to notices of intended entry.

Environmental Management Branch of Nature Conservation Division is responsible for:

- collation and analysis of data;
- data presentation and analysis; and
- draft text describing and interpreting trends.

Forest Policy and Practices Branch is responsible for collating this information together with information from other KPI into a report to the Conservation Commission.

The Conservation Commission is responsible for performance assessment and the publication of its report.

16.2.11. Work Instructions

1. Officer in each Region (Swan, South West, Warren) to maintain database of relevant information from the schedule attached to notices of intended entry.
2. Environmental Officer of Environmental Management Branch to request lists of notices of intended entry from South West, Swan and Warren Regions prior to annual reporting date.
3. Environmental officer to collate information from notices of intended entry schedules and present for total area of the Forest Management Plan the number of notices of intended entry served to the Department, type of material extracted and the quantity removed. This information to be provided for each land category as

shown in table 1 (below) and is used to assist interpretation of the more general information that is presented for this KPI (see above).

Table 1: Extraction of basic raw materials by land category (as proposed in the Forest Management Plan) for area of Forest Management Plan as at reporting period 2004

Material extracted	Land Category	Region	Notices of intended entry	Quantity removed
Shale				
Sand				
Clay				
Gravel				
Limestone				

17. KPI 28 - Adaptive management

17.1. Background information from the Forest Management Plan

The overall objective of the Forest Management Plan in relation to plan implementation is:

The plan proposes the following Actions for the purpose of seeking to ensure that forest management is undertaken in accordance with the plan and is continually improved so as to achieve best practice: (Forest Management Plan p61)

Forest Management Plan extract (page 64)

<i>Key performance indicator 28</i>	<i>Adaptive management.</i>
<i>Performance measure</i>	<i>The number and topic of formal adaptive management trials.</i>
<i>Performance target(s)</i>	<i>Within five years, trials will be held into at least two separate issues detailed in the plan's action statements.</i>
<i>Reporting</i>	<i>Five years.</i>
<i>Response to target shortfall</i>	<i>Department to report to the Conservation Commission and to the Minister for the Environment on measures required to address achievement.</i>

The objective in relation to adaptive management is:

The plan proposes the following Actions for the purpose of seeking to provide for adaptive management to improve forest management (Forest Management Plan p62)

Most relevant Forest Management Plan actions:

- 33.1 *The Department and the Forest Products Commission will, in cooperation with the Water and Rivers Commission and the Water Corporation, and in consultation with the Conservation Commission, conduct research in relation to the extent to which stream zones in informal reserves adequately protect biodiversity, water quality and water quantity in areas subject to timber harvesting.*
- 33.2 *The Department will, in consultation with the Conservation Commission, conduct trials, where reasonable and practicable, of improvements to silviculture and fire management practices.*
- 33.3 *The Forest Products Commission will test methods to increase the utilisation of sawlogs below first and second grade standards.*

17.2. Protocol for Key Performance Indicator 28

17.2.1. Objective of the KPI

The objective of KPI 28 is to assess the success of the implementation of the Forest Management Plan in achieving its targets through undertaking adaptive management trials aimed at improving forest management.

17.2.2. *Rationale*

Adaptive management is a key component of the management system envisaged in the Forest Management Plan, recognising that there is an incomplete knowledge of the effects of management practices on ecosystems. This performance measure is important for monitoring the continual improvement of knowledge in forest management practices, through adaptive management trials.

17.2.3. *Background and context*

Knowledge can be gathered by experimentation (research), adaptive management trials, formal and informal monitoring programs and compliance checking through supervision and audit.

The research, adaptive management trials, monitoring and performance assessment proposed in the Plan is used to provide the knowledge to adapt management. Results from adaptive management trials are expected to become available at the mid-term review of the plan. Decisions on the implications for management is made in the second half of the plan period and may be implemented immediately or built into planning for the subsequent plan period.

17.2.4. *The entities to be measured for the KPI*

Entity	Target
Formal adaptive management trials.	Trials to be held into at least two separate issues detailed in the plan's action statements within five years.

17.2.5. *Required data*

Required data	Collection & storage method	Custodians
The number of formal adaptive management trials conducted.	Formal adaptive management trials to be conducted and recorded by relevant custodians.	Custodians according to the topic of the trials may include Forest Policy and Practices Branch, Forest Management Branch, Science Division or Forest Products Commission.

17.2.6. *Calculation method*

Entity to be measured	Calculation method
Number of formal adaptive management trials conducted relating to issues referred to in the plans action statements.	Adaptive management trials are to be conducted according to the plan's action statements. Forest Policy and Practices Branch to collate the trials with DEC involvement into a list detailing the topic, title (issue) and a description of each trial prior to five-year reporting. FPC is to collate the trials with FPC involvement into a list detailing the topic, title (issue) and a description of each trial prior to five-year reporting.

17.2.7. *Measurement, calculation and reporting frequency*

Required metric	Measurement frequency	Calculation frequency
Number and topic of trials conducted	Five-yearly	Five-yearly

17.2.8. *Data presentation*

Metric	Presentation
Topic of trial	Description of each adaptive management trial to be provided.
Title of trial	
Description of trials conducted	

17.2.9. *Responsibility*

Custodians in DEC are responsible for:

- conducting trials according to the plan's action statements;
- recording results of trials; and
- providing Forest Policy and Practices Branch with the topic and title (issue) of trials and a description of each trial prior to five-year reporting.

Forest Policy and Practices Branch is responsible for coordinating the information for trials involving DEC, in terms of:

- data collation;
- data presentation and interpretation; and
- collation of information for this KPI together with other KPI into a report to the Conservation Commission.

Forest Products Commission is responsible for coordinating the information for trials involving FPC, in terms of:

- data collation;
- data presentation and interpretation; and
- collation of information for this KPI together with other KPI that require reporting by FPC into a report to the Conservation Commission.

The Conservation Commission is responsible for performance assessment and publication of its report.

18. KPI 29 - Provide for public involvement activities and public education, awareness and extension programs and make available forest-related information

18.1. Background information from the Forest Management Plan

The overall objective of the Forest Management Plan in relation to plan implementation is:

The plan proposes the following Actions for the purpose of seeking to ensure that forest management is undertaken in accordance with the plan and is continually improved so as to achieve best practice: (Forest Management Plan p61)

Forest Management Plan extract (page 65)

<i>Key performance indicator 29</i>	<i>Provide for public involvement activities and public education, awareness and extension programs and make available forest-related information.</i>
<i>Performance measure</i>	<i>Compilation of programs for public involvement, education, awareness and extension programs.</i>
<i>Performance target(s)</i>	<i>Available programs and numbers of the community exposed to programs increases over time.</i>
<i>Reporting</i>	<i>Annually.</i>
<i>Response to target shortfall</i>	<i>The Department to investigate the cause and report to the Conservation Commission and to the Minister for the Environment.</i>

The objective in relation to community involvement is:

The plan proposes the following Actions for the purpose of seeking to provide opportunities for Government agencies, non-government organisations and the community to participate in plan implementation: (Forest Management Plan p63)

Most relevant Forest Management Plan actions:

- 35.1 *The Department and the Forest Products Commission will, when required by the provisions of the plan, undertake public consultation in relation to the development and review of management policies and guidelines.*
- 35.2 *The Department will:*
- 35.2.1 *develop and implement programs that seek to provide the community with educational opportunities and information on ecologically sustainable forest management, in particular information relating to the sustained yield statistics and models;*
 - 35.2.2 *establish public consultation processes;*
 - 35.2.3 *provide opportunities for community participation in voluntary activities and educational and social development programs relating to ecologically sustainable forest management; and*
 - 35.2.4 *provide a range of opportunities for volunteers to be involved in forest management activities.*

18.2. Protocol for Key Performance Indicator 29

18.2.1. Objective of the KPI

The objective of KPI 29 is to assess the success of the implementation of the Forest Management Plan in achieving its targets by tracking progress in the number of programs for public involvement and the numbers of the community exposed to forest-related programs.

18.2.2. Rationale

The information from this KPI is important in assessing the achievement of the commitment to increasing public participation, knowledge and awareness through continued development and coordination of community education programs. Building community awareness and support is essential for sustainable forest management. Tracking the number of programs and the numbers of the community exposed to forest-related programs will help determine if community involvement is increasing, which is the objective of the Forest Management Plan.

18.2.3. Background and context

Public participation is an ongoing process that can improve communication, interaction and joint decision-making between different stakeholders. Through public participation, all parties become better informed about the range of views on proposals and issues. Most importantly, a good public participation process will result in better decisions that are more sensitive and responsive to public concerns and values.

The Department is committed to public participation and supports the right of members of the public to have a meaningful role in conserving Western Australia's natural environment to ensure healthy ecosystems, social and economic well-being and conservation of biological diversity for present and future generations. This is based on recognition that providing a range of educational opportunities will contribute to a more informed public and increase the community's appreciation of the natural environment and capacity to participate in public land management.

18.2.4. Issues

Not all programs are readily measurable but the Department will report on those programs where information can be reasonably gathered.

18.2.5. The entities to be measured for the KPI

Entity	Target
Forest-related programs available to the community.	Programs available to the public increase over time.
Community involvement in those programs	Numbers of the community exposed to programs increase over time.

18.2.6. *Required data*

Required data	Collection & storage method	Custodians
<p>Number of forest-related programs available to the public from:</p> <p>Regional Services</p> <ul style="list-style-type: none"> • Urban Nature • Nearer to Nature • Swan Region • Southwest Region • Warren Region <p>Parks and Visitor Services;</p> <ul style="list-style-type: none"> • Interpretation and Visitor Information Services • Tracks & Trails Unit • Indigenous Heritage Unit • Community Involvement Unit <p>Strategic Development & Corporate Affairs</p> <ul style="list-style-type: none"> • Eco-education • Programs and Publications Section • eMedia. 	<p>Custodians to identify forest-related community involvement programs and record the number of those programs provided to the public annually</p>	<p>Regional Services</p> <ul style="list-style-type: none"> • Urban Nature • Nearer to Nature • Swan Region • Southwest Region • Warren Region <p>Parks and Visitor Services;</p> <ul style="list-style-type: none"> • Interpretation and Visitor Information Services • Tracks & Trails Unit • Indigenous Heritage Unit • Community Involvement Unit <p>Strategic Development & Corporate Affairs</p> <ul style="list-style-type: none"> • Eco-education • Programs and Publications Section • eMedia
<p>Numbers of the community involved in those programs through:</p> <ul style="list-style-type: none"> • direct active participation • direct education/awareness programs • education/awareness via Internet (hits per site) • education/awareness packages 	<p>Custodians of forest-related community involvement programs to maintain register of numbers of the community involved in those programs annually</p>	

18.2.7. *Calculation method*

Parameter to be measured	Calculation method
<p>Number of forest-related programs available over annual reporting periods</p>	<p>Sum of all forest-related programs that were made available over annual reporting periods from</p> <p>Regional Services</p> <ul style="list-style-type: none"> • Urban Nature • Nearer to Nature

Parameter to be measured	Calculation method
	<ul style="list-style-type: none"> • Swan Region • Southwest Region • Warren Region <p>Parks and Visitor Services;</p> <ul style="list-style-type: none"> • Interpretation and Visitor Information Services • Tracks & Trails Unit • Indigenous Heritage Unit, • Community Involvement Unit <p>Strategic Development & Corporate Affairs</p> <ul style="list-style-type: none"> • Eco-education • Programs and Publications Section • eMedia
Numbers of the community involved in forest-related programs over annual reporting periods.	Sum of members of the community involved in those programs.

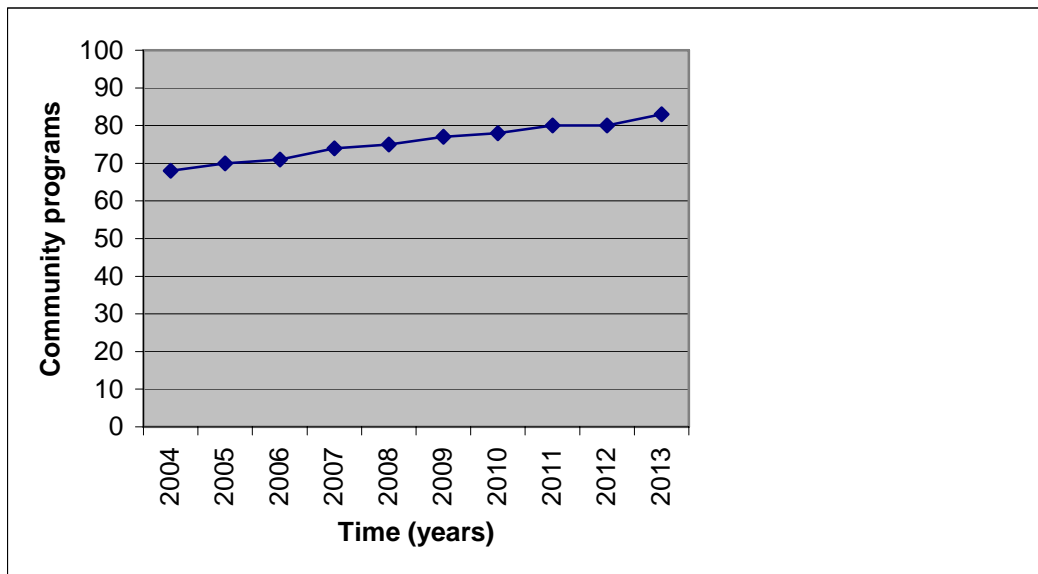
18.2.8. *Measurement, calculation and reporting frequency*

Required metric	Measurement frequency	Calculation frequency
Number of programs	Annually	Calculations to coincide with annual review process for the DEC Annual Report.
Numbers of community	Annually	

18.2.9. *Data presentation*

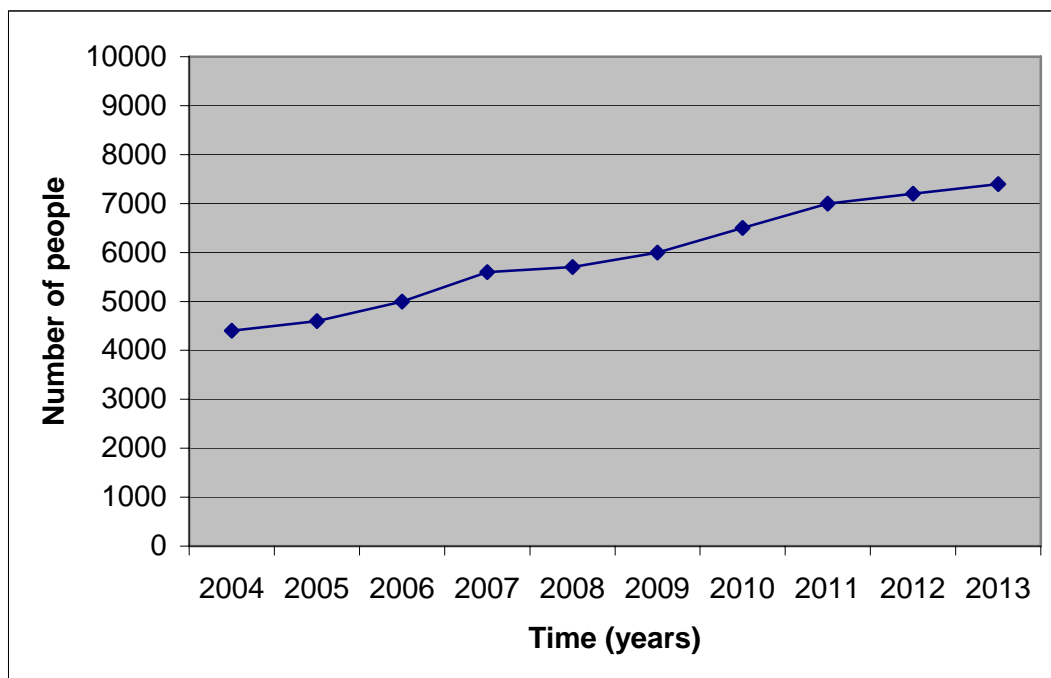
Metric	Presentation
Number of programs	Data to be presented as a line graph to show progression over reporting periods. Text to explain data and describe any trends.
Number of people	

Figure 1: Number of forest-related community programs available over annual reporting periods.



* Arbitrary figures have been used to demonstrate data presentation

Figure 2: Number of people involved in DEC initiated forest-related programs over annual reporting periods.



* Arbitrary figures have been used to demonstrate data presentation

18.2.10. Responsibility

Regional Services: Urban Nature, Nearer to Nature, Swan Region, Southwest Region and Warren Region.

Parks and Visitor Services: Interpretation and Visitor Information Services, Tracks & Trails Unit, Indigenous Heritage Unit, Community Involvement.

Strategic Development & Corporate Affairs: Eco-education, Programs and Publications Section, eMedia.

The above groups are responsible for:

- collection and management of data for forest-related community involvement programs provided annually; and
- drafting text to describe and interpret trends.

Visitor and Regional Services in the Parks and Visitor Services Division is responsible for:

- collation of information provided by the different custodians;
- analysis of data;
- data presentation and analysis; and
- draft text describing and interpreting trends.

Forest Policy and Practices Branch is responsible for collating this information together with information from other KPI into a report to the Conservation Commission.

The Conservation Commission is responsible for auditing, reviewing and the publication of its report.

18.2.11. Work Instructions

Relevant custodians are required to:

1. Compile a list of all public involvement activities, public education programs, public awareness programs and extension programs that are forest-related. See table 1 (below). * Definitions of a) the various fields of public communication and b) the meaning of forest-related are provided below to assist in refining the data consistently across the Department.
2. Attribute numbers of the community involved in each of the communication fields according to Table 1 (below).
3. Forward lists annually to Visitor and Regional Services in the Parks and Visitor Services Division prior to annual reporting so that data from across the Department can be collated and presented according to Figure 1 and Figure 2 (above).
4. Text to explain data and provide any additional information on the quality of those programs listed, the success of those programs in achieving set outcomes and increasing public awareness. Additional information provided by custodians might focus on:
 - the level of recurrent participation of school communities;
 - the number of new teachers participating in the programs; and
 - changes in responses to attitudinal surveys.

18.2.12. Definitions

Term	Definition
Forest-related	<p>Forest-related is defined as the area which is the main focus of the Forest Management Plan which is the area within the Regional Forest Agreement boundary within the area to which the Forest Management Plan applies (see Map 5 of the Forest Management Plan). Forest-related encompasses the seven criteria for sustainability as described in the Forest Management Plan:</p> <ul style="list-style-type: none"> • biodiversity; • productive capacity; • ecosystem health and vitality; • soil and water; • global carbon cycles; • natural and cultural heritage; and • socio-economic.
Public involvement activities	<p>Activities that seek personal interaction with individuals and groups considering issues in planning and management and partaking in activities to address those issues (also called community involvement).</p>
Public education	<p>Programs that involve establishing learning programs for special interest groups with defined outcomes embraced as a 'contract' between the learning facilitator and the learner or their representative. Also called community education and includes but is not the exclusive domain of 'schools programs'. It can also include 'interpretation programs' for visitors to sites and attractions where the focus is on conveying values.</p>
Public awareness	<p>Providing basic factual information, usually a one-way communication to attract attention and pass on information about an issue to the general public. Also called public information, publicity, promotion, or public relations.</p>
Extension programs	<p>A communication strategy embracing professional liaison with specific individuals and groups. Advisory services are usually of a technical nature and consultation often involves a fee-for-service.</p>

Table 1: Community involvement programs (forest-related) and number of people involved over annual reporting periods.

Communication field	2005		2006		2007		2008		2009		2010		Total	
	P	C	P	C	P	C	P	C	P	C	P	C	Programs	People
Public involvement activities														
Public education														
Awareness														
Extension programs														
Total														

P = Number of programs provided

C = Community involvement (number of people)

19. KPI 30 - Develop and maintain human resource skills across relevant disciplines

19.1. Background information from the Forest Management Plan

The overall objective of the Forest Management Plan in relation to plan implementation is:

The plan proposes the following Actions for the purpose of seeking to ensure that forest management is undertaken in accordance with the plan and is continually improved so as to achieve best practice: (Forest Management Plan p61)

Forest Management Plan extract (page 65)

<i>Key performance indicator 30</i>	<i>Develop and maintain human resource skills across relevant disciplines.</i>
<i>Performance measure</i>	<i>The extent to which the Department demonstrates the capacity and commitment to develop and maintain the essential skills of staff.</i>
<i>Performance target(s)</i>	<i>Persons responsible for undertaking key tasks on average meet 80 per cent of the competency requirements for key tasks indicated in the environmental management system.</i>
<i>Reporting</i>	<i>Annually.</i>
<i>Response to target shortfall</i>	<i>The Department and the Forest Products Commission to investigate the cause and report to the Conservation Commission and in the case of the Department, to the Minister for the Environment.</i>

The objective in relation to developing and maintaining human resource skills across relevant disciplines is:

The plan proposes the following Actions for the purpose of seeking to generate and transfer knowledge and develop the necessary skills and competencies in staff of the Department and staff and contractors of the Forest Products Commission, with a view to leading to improvements in forest management: (Forest Management Plan p64)

Most relevant Forest Management Plan actions:

- 38.1 *The Department will develop and implement research programs, in cooperation with the Conservation Commission, including the research referred to in Actions 9.1 and 9.2.*
- 38.2 *The Department and the Forest Products Commission will take reasonable and practicable steps to:*
- 38.2.1 *identify the skills required to competently undertake the key tasks referred to in Action 37.1.2;*
 - 38.2.2 *review the skills and competency levels of persons responsible for undertaking those tasks; and*
 - 38.2.3 *initiate training and other programs to increase skill and competency levels where they are deficient.*

19.2. Protocol for Key Performance Indicator 30

19.2.1. Objective of the KPI:

The objective of KPI 30 is to assess the success of the implementation of the Forest Management Plan in achieving its targets by examining the extent to which the Department and Forest Products Commission demonstrate the capacity and commitment to develop and maintain the essential skills of staff.

19.2.2. Rationale

Data gathered from this KPI will assist the Department and Forest Products Commission to develop appropriate training programs to enhance skills acquisition for staff so that the objectives of the Forest Management Plan can be more effectively achieved.

19.2.3. Background and context

Full and effective implementation of many of the actions identified in the Forest Management Plan will require improvement in knowledge and understanding in relation to the range of forest values and systems for implementation of the plan.

In order to implement management strategies effectively, the workforce should be appropriately skilled. Formal skills development through training is one element of establishing competence. However, acknowledgement of other sources of skills development through experience and education is important.

19.2.4. Issues

The performance target for this KPI (average of 80 per cent staff competency) is based on the expected completion of a fully accredited Environmental Management System. KPI 32 of the Forest Management Plan includes the development of a Departmental Environmental Management System.

This protocol is an interim measure for KPI 30 in order to address the objectives of the Forest Management Plan for initial reporting periods, in the absence of an accredited Environmental Management System in the Department. The protocol for measuring this KPI will be reviewed after the Environmental Management System is developed. It is necessary to develop criteria to allow measurement of competence for particular tasks.

19.2.5. The entities to be measured for the KPI

Entity	Target
Expenditure on staff training and development related to implementation of the plan.	No target
Competency of staff	Staff responsible for undertaking key tasks on average meet 80 per cent of the competency requirements for key tasks.

19.2.6. *Required data*

Required data	Collection & storage method	Custodians
Number of full time equivalent staff for each financial year related to implementation of the plan.	Data collected and stored by Workforce Systems Analyst.	People Services Branch, DEC. FPC.
Total expenditure on training and development across the department for each financial year related to implementation of the plan.	Data collected and stored by the Co-coordinator of Organisational Learning and Development.	People Services Branch, DEC. FPC
Yearly competency measure for all staff related to implementation of the plan (see work instructions below).	Data collected by relevant staff and supervisors and forwarded to Co-coordinator of Organisational Learning and Development.	People Services Branch, DEC. FPC

19.2.7. *Calculation method*

Entity to be measured	Calculation method
Expenditure on training and development.	Sum of DEC expenditure on training and development related to implementation of the plan. Sum of FPC expenditure on training and development related to implementation of the plan.
Expenditure on training and development per Full Time Equivalent employee.	Total expenditure by DEC and FPC respectively on training and development divided by the total number of Full Time Equivalent positions to provide average expenditure per person related to implementation of the plan.
Mean level of competency for staff.	Calculate the mean competency for all staff related to implementation of the plan in completing the key tasks identified in their job descriptions over annual reporting periods. Internal competency validation to be conducted by peers or supervisors according to electronic assessment tool (to be developed). For more information on competency evaluation see work instructions below.

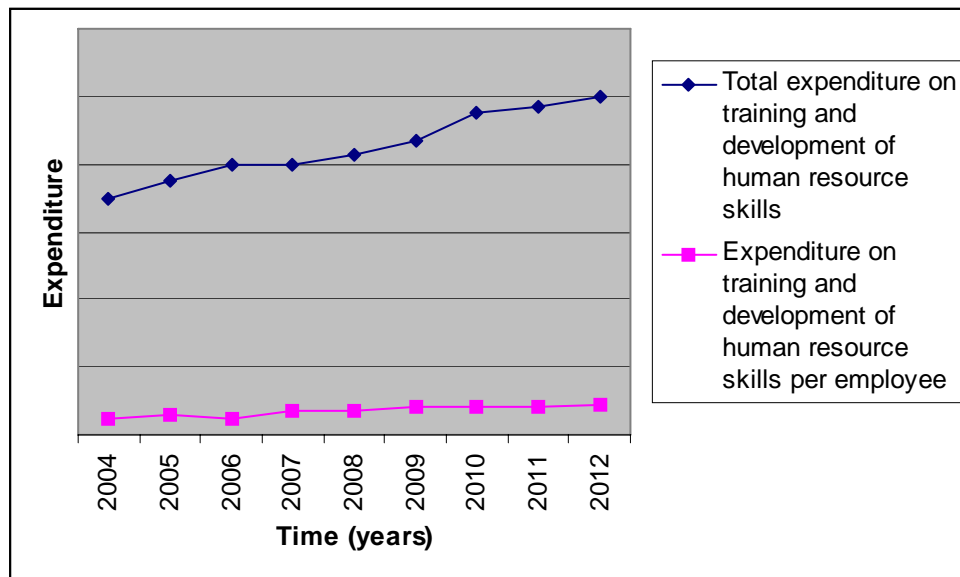
19.2.8. *Measurement, calculation and reporting frequency*

Required metric	Measurement frequency	Calculation frequency
Expenditure	Yearly	Calculated according to budget figures at close of financial year.
Competency	Yearly	Calculated at the end of each reporting period for the Forest Management Plan.

19.2.9. Data presentation

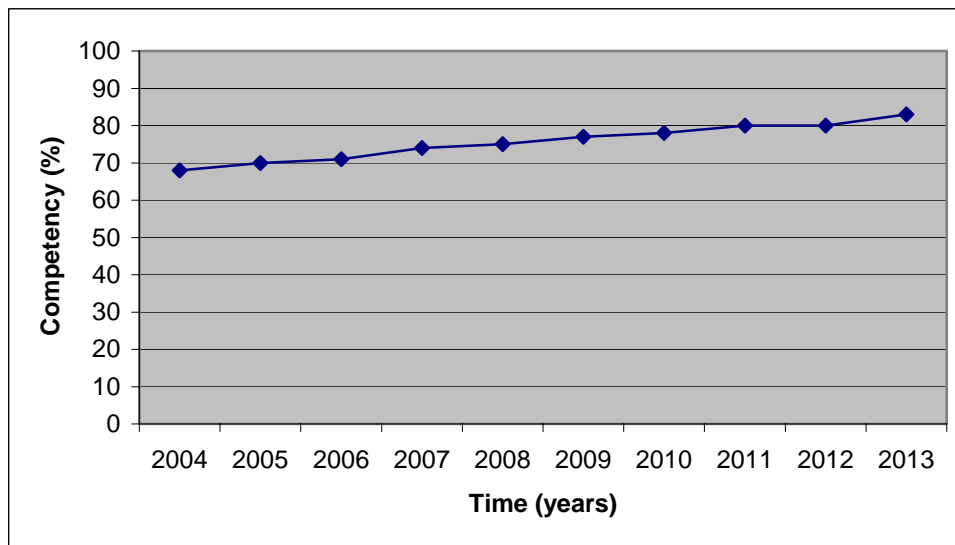
Metric	Presentation
Expenditure (\$)	A line graph demonstrating total expenditure by DEC and FPC respectively on training and development related to implementation of the plan and the mean expenditure for Full Time Equivalent positions over reporting periods. Text to explain the data and analyse trends.
Competency (%)	A line graph to demonstrate the percentage of staff achieving competency requirements for key tasks related to implementation of the plan according to job description forms. Text to describe the data and analyse the success of training and development programs.

Figure 1. DEC's expenditure on staff training and development and trainee programs related to implementation of the plan over reporting periods for each financial year.



* Arbitrary figures have been used to demonstrate predicted progression

Figure 2. Competency of staff in relation to key tasks for implementation of the Forest Management Plan.



* Arbitrary figures have been used to demonstrate predicted progression

19.2.10. Responsibility

Staff involved in the implementation of the Forest Management Plan are responsible for conducting internal competency validation with peers or supervisors annually.

Organisational Learning and Development Section of People Services Branch, DEC, is responsible for coordinating information related to DEC in terms of:

- data collection and management;
- data collation;
- data presentation and analysis;
- draft text describing and interpreting trends; and
- forwarding data to Forest Policy and Practices Branch for annual reporting.

Forest Policy and Practices Branch is responsible for collating information for this KPI together with other KPI into a report to the Conservation Commission.

FPC is responsible for coordinating information related to FPC in terms of:

- data collection and management;
- data collation;
- data presentation and analysis;
- text describing and interpreting trends; and
- collation of information for this KPI together with other KPI that require reporting by FPC into a report to the Conservation Commission.

The Conservation Commission is responsible for performance assessment and the publication of its report.

19.2.11. *Work Instructions*

Staff Competency Pilot

This assessment process has been designed as an interim measure to meet the requirements of the Forest Management Plan until a comprehensive system for evaluating competency is undertaken by the Department. The process is based on the performance criteria used in assessing for Units of Competence (UoC) in order to align the process with national standards.

*Note: This is a monitoring process and it will not provide staff with any UoC accreditation.

Competency assessment process:

1. Identify core business areas for staff involved in the implementation of the Forest Management Plan.
2. Determine individual UoC's that are relevant to the core business of staff involved in the implementation of the Forest Management Plan (see list 1 below).
3. Develop assessment tools that measure performance against elements of competence / performance criteria for the relevant UoC's. For DEC, assessment tools to be developed by Forest Policy and Practices Branch (PPB) and Organisational Learning and Development in co-ordination with qualified trainers/assessors.
4. Select a sample group of staff involved in the implementation of the Forest Management Plan (as an indicator group) to test competency in completing key tasks. For DEC, the sample size and type of jobs assessed is decided by FPPB and Organisational Learning and Development.
5. Staff to conduct self-assessment on competency using self-assessment tool.
6. Manager / supervisor or peer to undertake independent assessment of selected staff member to identify gaps.
7. Establish levels of competency and present results as an interim performance measure to address part requirement of KPI 30 of the Forest Management Plan.

List I. List of Units of Competency from DEC training package that could be used to establish performance standards in undertaking key tasks for staff within the Department.

Protect places of cultural significance
 Collect and preserve biological samples
 Monitor projects in a program
 Lead work teams
 Read and interpret maps
 Produce maps for land management purposes
 Recognise plants

* This list is not comprehensive at this stage. It is likely that other Units of Competency is drawn from training packages such as Forest Industries, Outdoor Recreation and others yet to be determined.

20. KPI 31 - Development of scientific understanding of ecosystem characteristics and functions

20.1. Background information from the Forest Management Plan

The overall objective of the Forest Management Plan in relation to plan implementation is:

The plan proposes the following Actions for the purpose of seeking to ensure that forest management is undertaken in accordance with the plan and is continually improved so as to achieve best practice: (Forest Management Plan p61)

Forest Management Plan extract (page 65)

<i>Key performance indicator 31</i>	<i>Development of scientific understanding of ecosystem characteristics and functions.</i>
<i>Performance measure</i>	<i>Expenditures on research and development related to ecologically sustainable forest management; Person years of scientific research, by ecosystem or disciplinary area of study, in the field of ecologically sustainable forest management; and/or Number of peer-reviewed articles published annually on ecologically sustainable forest management.</i>
<i>Performance target(s)</i>	<i>No target.</i>
<i>Reporting</i>	<i>Annually.</i>
<i>Response to report</i>	<i>The Conservation Commission to review the scientific effort in forests in relation to the total Departmental effort and discuss priorities with the Department.</i>

The objective in relation to knowledge is:

The plan proposes the following Actions for the purpose of seeking to generate and transfer knowledge and develop the necessary skills and competencies in staff of the Department and staff and contractors of the Forest Products Commission, with a view to leading to improvements in forest management: (Forest Management Plan p64)

Most relevant Forest Management Plan actions:

38.1 The Department will develop and implement research programs, in cooperation with the Conservation Commission, including the research referred to in Actions 9.1 and 9.2.

The objective in relation to developing scientific understanding of ecosystem characteristics and functions is:

The plan proposes the following Actions at the whole of forest scale for the purpose of seeking to develop an improved understanding of the biodiversity of forest regions and the response of forest ecosystems to natural and human induced disturbance, with a view to improving forest management practices: (Forest Management Plan p29)

Most relevant Forest Management Plan actions:

9.1 The Department will undertake biological surveys, which is:

- 9.1.1 *of priority areas determined in consultation with the Conservation Commission; and*
 - 9.1.2 *used, where appropriate, to assist in evaluating the extent to which biodiversity is being conserved and the need for any review of the reserve system.*
- 9.2 *The Department will:*
- 9.2.1 *continue to monitor the effect of disturbance from timber harvesting on fauna and flora in the Kingston study³ area;*
 - 9.2.2 *implement the species, community and process monitoring program, FORESTCHECK; 9.2.3 conduct a monitoring trial using a specific species sampling approach and review the comparative effectiveness of this and the monitoring protocol adopted for FORESTCHECK since its inception in 2001; and*
 - 9.2.4 *maintain a research program on ecologically sustainable forest management which is prepared in a manner that has regard to advice from the Conservation Commission's Research Advisory Committee.*

20.2. Protocol for Key Performance Indicator 31

20.2.1. Objective of the KPI

The objective of KPI 31 is to assess the success of the implementation of the Forest Management Plan through monitoring the development of scientific understanding in relation to sustainable forest management.

20.2.2. Rationale

Full and effective implementation of many of the actions identified in the new forest management plan will require improvement in knowledge and understanding of southwest forests. This KPI will assist in monitoring the progress and development of scientific research needed to improve this knowledge.

20.2.3. Background and context

The annual Output Purchaser Provider process includes an agreement between Sustainable Forest Management Division and Science Division for each financial year on the expenditure on scientific research in the area of forest management. Included in the Output Purchaser Provider documentation is an attachment that details expenditure to the project level. Output Purchaser Provider documents between Science Division and Nature Conservation Division will need to be scrutinized to ensure all projects related to sustainable forest management are included.

Science Division produces an Annual Research Activity Report that contains a list of publications for the financial year that includes publications relating to sustainable forest management. This information is made available on the Science Division internet website.

Forest Management Branch and Forest Policy and Practices Branch may also be involved in research projects, or contract research and development projects to consultants or universities.

20.2.4. Issues

Data is not as readily available for the number of person years committed to scientific research but information can be gathered using Full Time Equivalent allocations to projects.

All research and development related to sustainable forest management needs to be captured under this KPI and this includes any research funded by the Department, whether undertaken by Department staff, consultants or universities, and whether funded by Sustainable Forest Management Division, Nature Conservation Division or Parks and Visitor Services.

20.2.5. The entities to be measured for the KPI

Entity	Target
Expenditure on research and development related to sustainable forest management.	No target
Person-years of scientific research, by ecosystems and disciplinary area of study, in the field of sustainable forest management.	
Publication of peer reviewed articles relevant to sustainable forest management.	

20.2.6. Required data

Required data	Collection & storage method	Custodians
Total expenditure on scientific research undertaken in the field of sustainable forest management.	Expenditure on research projects is collected by Science Division and stored in the Sustainable Forest Management Output Purchaser Provider documentation with Science Division. This has an attachment that details expenditure to project level. Expenditure through Nature Conservation Division, Parks and Visitor Services, Forest Management Branch and Forest Policy and Practices Branch will also be collated.	Sustainable Forest Management Division, Science Division, Nature Conservation Division and Parks and Visitor Services.
Total number of person-years of scientific research devoted to each disciplinary area of study in the field of sustainable forest management.	Collected from Full Time Equivalent allocations to projects.	
Total number of peer reviewed articles published in the field of sustainable forest management for each reporting period	Science Division produces an Annual Research Activity Report that contains a list of publications for the financial year. Research publications resulting from non Science Division research related to sustainable forest management funded by the Department.	

20.2.7. *Calculation method*

Entity to be measured	Calculation method
Expenditure	The figure of total expenditure to include money spent directly on research and other associated costs as detailed in the Sustainable Forest Management and other Output Purchaser Provider documents with Science Division. Total expenditure on non Science Division research related to sustainable forest management funded by the Department.
Person-years	Science Division to refine list of research projects related to the field of sustainable forest management into specific disciplinary area of study. The total number of person-years of research to be calculated annually from Full Time Equivalent allocations to projects. Science Division to undertake same process for non Science Division research related to sustainable forest management funded by the Department.
Publications	Science Division to refine list of published peer reviewed articles from Annual Research Activity Report to a list of articles directly related to the field of sustainable forest management. Science Division to undertake same process for non Science Division research related to sustainable forest management funded by the Department.

20.2.8. *Measurement, calculation and reporting frequency*

Required metric	Measurement frequency	Calculation frequency
Expenditure (dollars)	Annually prior to the end of the financial year.	Annually prior to the end of the financial year.
Person years (years)		
Publications (number)		

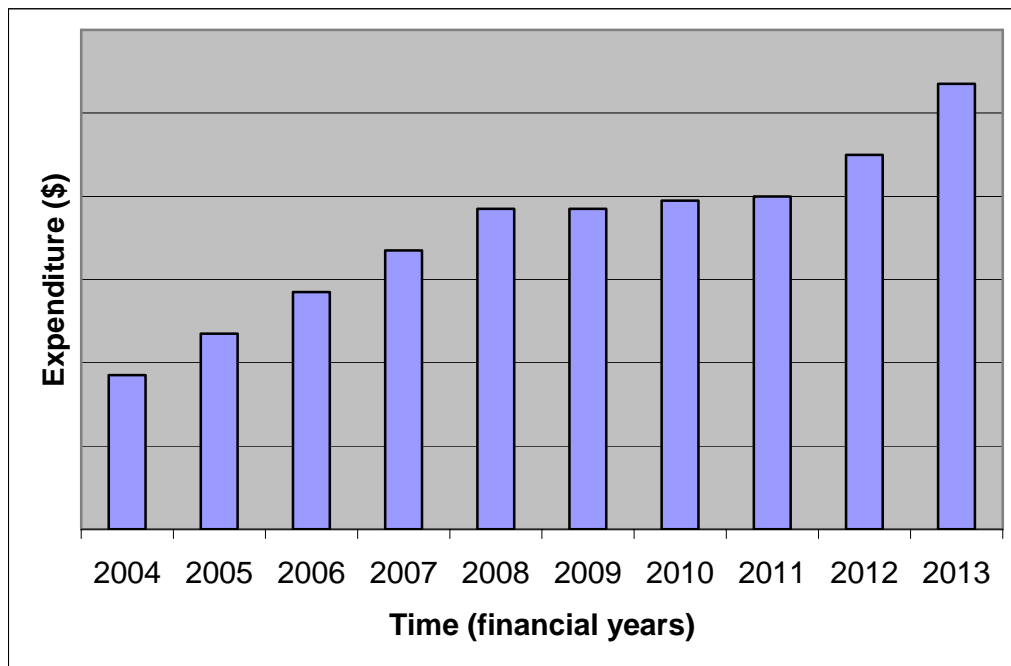
20.2.9. *Data presentation*

Metric	Presentation
Expenditure (dollars)	Total number of published articles, person-years of scientific research dedicated and expenditure to be presented in a table (table 1) and figures (figure 1 and 2), by ecosystem and disciplinary area of study, in the field of sustainable forest management for annual reporting periods.
Person years (years)	
Publications (number)	

Table 1: Total number of published articles, person-years of scientific research and expenditure by disciplinary area of study in the field of sustainable forest management for the financial year of 2003/2004.

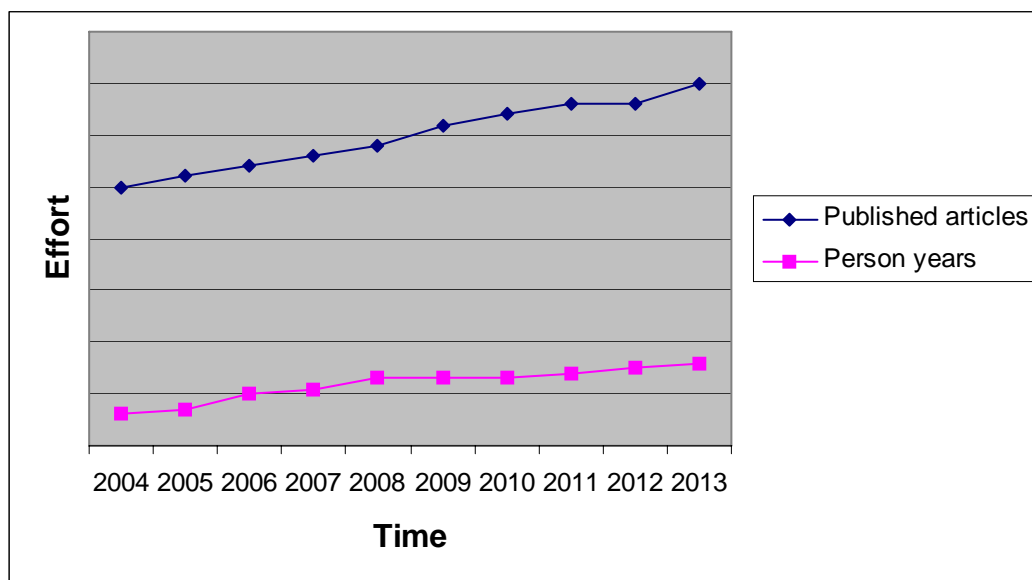
Ecosystem	Disciplinary area of study	Articles published	Person-years dedicated	Expenditure
Jarrah	Biological Diversity			
	Productivity			
	Ecosystem health and vitality			
	Soil and water			
	Natural and cultural heritage			
	Socio economic benefits			
Karri	Biological Diversity			
	Productivity			
	Ecosystem health and vitality			
	Soil and water			
	Natural and cultural heritage			
	Socio economic benefits			
Other	Biological Diversity			
	Productivity			
	Ecosystem health and vitality			
	Soil and water			
	Natural and cultural heritage			
	Socio economic benefits			
Total	Biological Diversity			
	Productivity			
	Ecosystem health and vitality			
	Soil and water			
	Natural and cultural heritage			
	Socio economic benefits			
Total				

Figure 1. Expenditure on scientific research in the field of sustainable forest management over annual reporting periods



* Arbitrary figures have been used to demonstrate data presentation

Figure 2. Number of published articles and person-years of scientific research in the field of sustainable forest management over annual reporting periods.



* Arbitrary figures have been used to demonstrate data presentation

20.2.10. Responsibility

Science Division is responsible for:

- data collection and management;

- data collation;
- data presentation and analysis; and
- draft text describing and interpreting trends.

Forest Policy and Practices Branch is responsible for collating information for this KPI together with other KPI into a report to the Conservation Commission.

The Conservation Commission is responsible for performance assessment and the publication of its report.

21. KPI 32 - Environmental management system

21.1. Background information from the Forest Management Plan

The overall objective of the Forest Management Plan in relation to plan implementation is:

The plan proposes the following Actions for the purpose of seeking to ensure that forest management is undertaken in accordance with the plan and is continually improved so as to achieve best practice: (Forest Management Plan p61)

Forest Management Plan extract (page 65)

<i>Key performance indicator 32</i>	<i>Environmental management system.</i>
<i>Performance measure</i>	<i>Development of a Departmental environmental management system (EMS) to a standard suitable for accreditation.</i>
<i>Performance target(s)</i>	<i>EMS developed by December 2005.</i>
<i>Reporting</i>	<i>December 2005.</i>
<i>Response to target shortfall</i>	<i>The Department to report to the Conservation Commission and to the Minister for the Environment on measures it proposes to complete the task and the completion date.</i>

The objective in relation to management and performance standards is:

The plan proposes the following Actions for the purpose of seeking to provide for continuous improvement in management and performance standards: (Forest Management Plan p63)

Most relevant Forest Management Plan actions:

- 36.1 *The Department will develop and maintain an environmental management system for forest management, which is to be independently accredited as conforming to AS/NZS ISO 14001.*
- 36.2 **(Plantations):** *The Forest Products Commission will maintain an environmental management system independently accredited as conforming to AS/NZS ISO 14001.*

21.2. Protocol for Key Performance Indicator 30

21.2.1. Objective of the KPI

The objective of KPI 32 is to assess the success of the implementation of the Forest Management Plan by providing information on the development of an Environmental Management System (EMS).

21.2.2. Rationale

A fully accredited and formal EMS will assist in determining the effectiveness of the implementation of the Forest Management Plan's objectives and strategies in relation

to planning, implementation, monitoring and any amendments due to adaptive management.

21.2.3. *Background and context*

A formal EMS provides a standard, systematic framework for management activities that facilitate a precautionary approach to adaptive management. The most widely accepted standard for an EMS is that of the AS/NZS ISO 14000 series.

The core component of an EMS is the analysis of all management activities to identify environmental aspects that arise in the course of those activities and then to rate them for their significance with respect to risk to the environment. An aspect is an element of an organisations activities, products or services that can interact with the environment. A significant aspect is one that can have a significant environmental impact.

The aspect rating process achieves the requirement of the precautionary approach to be guided by a careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment. The EMS then requires controls on operations to ameliorate the risk of adverse environmental impacts followed by monitoring, performance assessment and review of the effectiveness of those controls.

An effective EMS provides a strong framework for a precautionary approach to management incorporating adaptive management. The precautionary principle requires an assessment of the risk-weighted consequences of various options. A formal risk management system is a systematic way of identifying risks, evaluating their significance and identifying options to ameliorate them to acceptable levels. Management can then weigh up the implications and make informed decisions.

An EMS for native forest harvesting and regeneration operations in Western Australia has been developed and is being implemented by the Forest Products Commission. Certification was achieved during 2001. Action 36.1 requires the Department to develop an EMS to cover its operations and responsibilities in respect of forest management.

21.2.4. *The entities to be measured for the KPI*

Entity	Target
Status of development of EMS.	EMS developed by December 2005.

21.2.5. *Required data*

Required data	Custodians
Status of development of EMS.	Forest Policy and Practices Branch.

21.2.6. *Measurement, calculation and reporting frequency*

Required metric	Measurement frequency	Calculation frequency
Status of development of EMS.	Annual until EMS is implemented	Annual until EMS is implemented

21.2.7. *Data presentation*

Metric	Presentation
Status of development of EMS.	Description of status of development of EMS.

21.2.8. *Responsibility*

Forest Policy and Practices Branch is responsible for reporting on the status of development and implementation of an EMS.

The Conservation Commission is responsible for performance assessment and the publication of its report.

22. KPI 33 - Operational control

22.1. Background information from the Forest Management Plan

The overall objective of the Forest Management Plan in relation to plan implementation is:

The plan proposes the following Actions for the purpose of seeking to ensure that forest management is undertaken in accordance with the plan and is continually improved so as to achieve best practice: (Forest Management Plan p61)

Forest Management Plan extract (page 66)

<i>Key performance indicator 33</i>	<i>Operational control.</i>
<i>Performance measure</i>	<i>The extent to which guidance documents have been prepared/reviewed and management modified to improve ecologically sustainable forest management.</i>
<i>Performance target(s)</i>	<i>All guidance documents referred to in the Actions proposed by the plan to be prepared/reviewed by mid-term.</i>
<i>Reporting</i>	<i>Annually.</i>
<i>Response to target shortfall</i>	<i>The Department to investigate the cause and report to the Conservation Commission and to the Minister for the Environment. The Conservation Commission to evaluate the need for revision of management practices in the context of its assessment and auditing function, in consultation with the Department.</i>

The objective in relation to review is:

The plan proposes the following Actions for the purpose of seeking to ensure that the plan Actions, policies and guidelines maintain their currency (Forest Management Plan p62)

Most relevant Forest Management Plan actions:

- 34.1 *The Department and the Conservation Commission will:*
- 34.1.1 *develop or maintain a comprehensive suite of operational guidance documents (see Appendix 1);*
 - 34.1.2 *evaluate the results from research, monitoring, audits and trialling of adaptive management practices to determine whether the plan, or guidelines and policies referred to in the plan, should be amended;*
 - 34.1.3 *amend the plan if required according to the CALM and EP Acts;*
 - 34.1.4 *initiate an independent expert review of silvicultural practices and their impacts on biodiversity during the second half of the life of the plan. The review will have regard to the results from FORESTCHECK and other research monitoring, audits, and adaptive management trials of these practices;*
 - 34.1.5 *adopt the same processes for consultation, advice and approval for amending policies and guidelines as described earlier in the plan to develop or review them; and*
 - 34.1.6 *take action that is reasonable and practicable to address problems identified in management systems.*

22.2. Protocol for Key Performance Indicator 33

22.2.1. Objective of the KPI

The objective of KPI 33 is to assess the success of the implementation of the Forest Management Plan in achieving its targets by ensuring that guidance documents maintain their currency.

22.2.2. Rationale

The regular review and updating of guidance documents is an important part of a management system aimed at delivering best practice. KPI 33 will assist this process by monitoring the progressive development and review of key subsidiary guidelines with the continued improvement of knowledge in forest management practices.

22.2.3. Background and context

Implementation of the plan by the Department and other agencies occurs within the guiding framework of policies, instructions, codes of practice and management guidelines. Action plans and operational prescriptions, developed by these bodies, make up the detailed works programs necessary to implement the strategies proposed in the plan, and meet the standard or outcome set. The Plan proposes a large number of actions aimed at improving practice and developing new information. This information needs to feed back into operational practice through review of existing guidelines and development of new guidelines.

22.2.4. Issues

The key subsidiary management guideline documents to the Forest Management Plan are detailed in Appendix 1 of the plan. Guidance documents to be prepared / reviewed is primarily, but not exclusively drawn from this list. Other documents will also be prepared / reviewed and is included in measurement for the reporting of this KPI.

22.2.5. The entities to be measured for the KPI

Entity	Target
Guidance documents	All guidance documents referred to in the Actions proposed by the plan to be prepared / reviewed by mid-term.

22.2.6. Required data

Required data	Collection & storage method	Custodians
Number of guidance documents prepared and reviewed annually.	All guidance documents prepared and reviewed to be recorded as and when completed by relevant custodians.	Custodians according to the subject of the guidance documents may include Forest Policy and Practices Branch, Forest Management Branch, Fire Management Services Branch, Nature Conservation Division, Conservation Commission and Forest Products Commission.

22.2.7. Calculation method

Entity to be measured	Calculation method
Number of guidance documents prepared and reviewed annually.	Guidance documents prepared or reviewed each year to be listed at reporting date. Performance measure is assessed mid-term. Forest Policy and Practices Branch to provide a list of guidance documents specifically referred to in the actions of the Forest Management Plan that have been prepared / reviewed to assess performance target for KPI.

22.2.8. Measurement, calculation and reporting frequency

Required metric	Measurement frequency	Calculation frequency
Number of guidance documents prepared and reviewed.	Annually	Annually, performance measure assessed at mid-term.

22.2.9. Data presentation

Required metric	Presentation
Number of guidance documents prepared.	Information is presented as a list with all documents progressed after each reporting period. Data will also be presented in tables (see table 1 and 2) to demonstrate progression towards mid-term performance target for the KPI. Table will include title of guidance document and the date prepared and reviewed. * The guidance documents included in the tables below have been taken from Appendix 1 of the Forest Management Plan.
Number of guidance documents reviewed.	

Table 1: Preparation and review of guidelines referred to in the actions proposed in the Plan.

Proposed guideline	Date prepared	Date reviewed
Guidelines for the Management of Informal Reserves Status: To be prepared by the Department in accordance with Action 3.1.2.		
Guidelines for Selection and Management of Fauna Habitat Zones Status: To be prepared by the Department in accordance with Action 7.2.2.		
Goals for Understorey Structural Diversity Status: To be prepared by the Department in accordance with Action 4.1.		
Fauna Distribution Information System Status: To be prepared by the Forest Products Commission in accordance with Action 8.4.		
Native Forest Timber Harvest Planning Guidelines Status: To be prepared by the Department by 31 December 2008 in accordance with Action 34.1.1		
Soil and Water Conservation Guidelines		

Proposed guideline	Date prepared	Date reviewed
Status: To be prepared by the Department in accordance with Action 20.1.2.		
Guidelines for the rehabilitation of plantation areas to be returned to native vegetation Status: To be prepared by the Department in accordance with Action 15.4.2.		
Forest Monitoring Guidelines Status: To be prepared by the Department by 31 December 2005 in accordance with Action 34.1.1.		
Key Performance Indicator Protocols Status: To be prepared by the Department in accordance with Action 32.6.		
Guidelines for the preparation of area management plans for conservation reserves Status: To be prepared by the Conservation Commission in accordance with Action 5.2.		
Indigenous Heritage Management Guidelines in accordance with action 25.2		
Non-indigenous Heritage Management Guidelines in accordance with action 25.2		
Existing guideline		
<i>Phytophthora cinnamomi</i> and Disease Caused by it – Volume 1. Management Guidelines Status: To be reviewed by the Department in accordance with Action 18.2.1.		
Jarrah Silviculture Guidelines		
Karri Silviculture Guidelines		
Wandoo Silviculture Guidelines		

Table 2: Other guidelines prepared or reviewed as is considered necessary by the Department.

Proposed documents:	Date prepared	Date reviewed	
Existing Documents:			

22.2.10. Responsibility

Custodians of key guidance documents are responsible for:

- preparing and reviewing relevant guidelines according to the plan's action statements; and
- providing Forest Policy and Practices Branch with details of the prepared / reviewed guideline prior to annual reporting.

Forest Policy and Practices Branch is responsible for:

- data collation;
- data presentation and interpretation; and
- collation of information for this KPI together with other KPI into a report to the Conservation Commission.

The Conservation Commission is responsible for performance assessment and publication of its report.