

# Sustainability Indicators for Tasmanian Forests

2001 – 2006

Prepared by the Tasmanian and  
Australian Governments for the 2007  
Ten Year Review of the Tasmanian  
Regional Forest Agreement

May 2007



Australian Government



## CONTENTS

Acronyms .....	viii
Executive summary .....	x
Introduction .....	1
Criterion 1: Conservation of biological diversity .....	6
1.1 Ecosystem diversity .....	6
1.1.a Extent of area of forest types .....	6
1.1.b Area of forest by growth stage.....	10
1.1.c Extent of area by forest type and reservation status .....	14
1.1.d Fragmentation of forest cover.....	19
1.1.e Area of old growth by forest type by reservation status .....	21
1.2 Species diversity .....	25
1.2.a Forest- dwelling species for which ecological information is available .....	25
1.2.b The status of forest-dwelling species at risk of not maintaining viable breeding populations, as determined by legislation or scientific assessment .....	28
1.2.c Representative species from a range of habitats monitored at scales relevant to regional forest management.....	33
1.3 Genetic diversity .....	43
1.3.a Forest-associated species at risk from isolation and the loss of genetic variation, and conservation efforts for those species .....	43
1.3.b Native forest and plantations of indigenous timber species which have genetic resource conservation mechanisms in place .....	49
Criterion 2: Maintenance of productive capacity of forest ecosystems.....	54
2.1.a Native forest area available for wood production, area harvested, and growing stock of merchantable and non-merchantable tree species .....	54
2.1.b Age class of plantations .....	57
2.1.c Annual removal of wood products compared to the volume Determined to be sustainable for native forests and future yields for plantations .....	59
2.1.d Annual removal of non-wood forest products compared to the level determined to be sustainable.....	64
2.1.e The area of native forest harvested and the proportion of that effectively regenerated, and the area of plantation clearfelled and the proportion of that effectively re- established .....	70
Criterion 3: Maintenance of ecosystem health and vitality .....	74
3.1.a Area and percentage of forest affected by processes or agents that may change ecosystem health and vitality.....	74
3.1.b Area of forest burnt by planned and unplanned fire .....	81
Criterion 4: Conservation and maintenance of soil and water resources.....	85
4.1.a Area of forest managed primarily for protective functions .....	85

4.1.b	Management of the risks of soil erosion and the risks to soil physical properties, water quantity and water quality in forests...	88
Criterion 5:	Maintenance of forest contributions to global carbon cycles.....	102
5.1.a	Total forest ecosystem biomass and carbon pool .....	102
Criterion 6:	Maintenance and enhancement of long-term multiple socio-economic benefits to meet the needs of society .....	105
6.1:	Production and consumption .....	105
6.1.a	Value and volume of wood and wood products.....	105
6.1.c	Value of forest based services.....	116
6.1.d	Production and consumption and import/export of wood, wood products and non-wood products .....	118
6.1.e	Degree of recycling of forest products.....	124
6.2:	Investment in the forest sector .....	126
6.2.a	Investment and expenditure in forest management .....	126
6.2.b	Investment in research, development, extension and use of new and improved technologies .....	129
6.3	Recreation and tourism .....	133
6.3.a	Area of forest available for general recreation and tourism .....	133
6.3.b	Range and use of recreation/tourism activities available.....	135
6.4	Cultural, social and spiritual needs and values .....	140
6.4.a	Area of forest to which indigenous people have use and rights that protect their special values and are recognised through formal and informal management regimes.....	140
6.4.b	Registered places of non-indigenous cultural values in forests that are formally managed to protect these values.....	144
6.4.c	The extent to which indigenous values are protected, maintained and enhanced through indigenous participation in forest management .....	147
6.4.d	The importance of forests to people.....	149
6.5:	Employment and community needs.....	150
6.5.a	Direct and indirect employment in the forest sector .....	150
6.5.b	Wage rates and injury rates within the forest sector .....	154
6.5.c	Resilience of forest dependant communities to changing social and economic conditions .....	159
6.5.d	Resilience of forest dependent indigenous communities to changing social and economic conditions.....	160
Criterion 7:	Legal institutional and economic framework for forest conservation and sustainable management .....	161
7.1.a	Extent to which the legal framework supports the conservation and sustainable management of forests .....	161
7.1.b	Extent to which the institutional framework supports the conservation and sustainable management of forests .....	169
7.1.c	Extent to which the economic framework supports the conservation and sustainable management of forests .....	184
7.1.d	Capacity to measure and monitor changes in the conservation and sustainable management of forests .....	186

7.1.e	Capacity to conduct and apply research and development aimed at improving forest management and delivery of forest goods and services.....	189
Appendix 1.1	.....	194
Appendix 1.2.b.1	Existing and proposed RFA priority species .....	262
Appendix 1.3.a	.....	284
Appendix 6.3.a	Reservation of high quality wilderness.....	306
Appendix 7.1.b	Community awareness.....	308
Appendix 7.1.d	Sustainability measuring and monitoring programs .....	310
Table 1.1.a	Extent of forest by tenure ( <i>a</i> ).....	9
Table 1.1.b	Area of native forest types by growth stage and tenure groups ( <i>a</i> ) .....	13
Table 1.1.c.1	Area of native forest type protected by IUCN category of reserve ( <i>a</i> )..	16
Table 1.1.c.2	Area of native forest type protected by reserve class ( <i>a</i> ).....	17
Table 1.1.c.3	Change in reservation status of native forest types.....	17
Table 1.1.e (i)	Old Growth by forest type and tenure ( <i>a</i> ).....	23
Table 1.1.e(ii)	Old Growth by forest type and reserve type ( <i>a</i> ) .....	24
Table 1.1.e (iii)	Change in reservation status of old growth by forests type .....	24
Table 1.2.a.1	Numbers of forest dwelling taxa within each group.....	26
Table 1.2.a.2	Changes to the list of forest dwelling vascular plant taxa .....	26
Table 1.2.a.3	Number of native forest associated species and level of information regarding those species available for management decisions.....	27
Table 1.2.b.1	Summary of changes in listing status of forest dwelling flora and fauna under <i>Threatened Species Protection Act 1995</i> since 2001 .....	29
Table 1.2.b.2	Changes to the EPBC Act status of RFA-Priority Species .....	29
Table 1.2.c.1	Breeding season survey data.....	39
Table 1.2.c.2	Nest activity of Tasmanian wedge-tailed eagles.....	40
Table 1.3.a	Forest-associated species potentially at risk from isolation and the loss of genetic variation, as a result of past human-induced or natural events .....	46
Table 1.3.b.1	Plantation and indigenous timber species for which a commitment has been made for genetic resource conservation .....	49
Table 2.1.a.1	Gross forest area and net forest area available for wood production as at 30 June 2006 .....	55
Table 2.1.a.2	Native forest area harvested.....	55
Table 2.1.a.3	Native forest area approved for harvesting.....	55
Table 2.1.b.1	Area of Tasmanian plantations in five-year age classes as at 31 December 2005 .....	57
Table 2.1.b.2	Plantation Area Trends 2001-2006 .....	58
Table 2.1.c.1	Annual removal of wood on public and private land.....	61
Table 2.1.c.2	Projected wood flow for all Tasmanian plantations in five-year time periods.....	62
Table 2.1.d.1	Apiary sites and hives on State forest land .....	65
Table 2.1.d.2	Estimated tree fern numbers by land tenure .....	65
Table 2.1.d.3	Tree fern harvesting .....	66

Table 2.1.d.4	Annual collection of native tree seed by Forestry Tasmania.....	67
Table 2.1.d.5	Annual harvest and culling of brushtail possums .....	68
Table 2.1.d.6	Annual harvest and culling of wallabies.....	68
Table 2.1.d.7	Annual harvest of deer.....	69
Table 2.1.e.1	Total area of native forest (public and private) planned for clearfell harvesting and proposed for regeneration, conversion to plantations or non-forest land use 1999-2000 to 2005-06.....	71
Table 2.1.e.2	Total planned area of plantation forest (public and private) harvested and proposed for re-establishment or converted to non-forest land use 1999-2000 to 2005-06.....	71
Table 2.1.e.3	Percentage of regenerated native forest meeting stocking on State forest lands .....	72
Table 2.1.e.4	Forest Practices Authority's annual audit performance rating for regeneration/re-establishment operations 2000-01 to 2002-03.....	73
Table 2.1.e.5	Forest Practices Authority's annual audit performance rating for regeneration/re-establishment operations 2003-04 to 2005-06.....	73
Table 3.1.a.1	Summary of the annual chrysomelid leaf beetle integrated pest management (IPM) program on State forest for the five years between 2001-02 – 2005-06 (Numbers in parentheses are areas as a percentage of total area that was monitored).....	76
Table 3.1.a.2	Browsing management done in clearfall, burn and sow coupes on State forest .....	77
Table 3.1.a.3	Soil testing for <i>Phytophthora cinnamomi</i> .....	79
Table 3.1.a.4	Number of occasions that gorse or pampas plants were detected during health surveillance of pine and eucalypt plantations on State forest .....	79
Table 3.1.b.1	Area (hectares) of forest types burnt by planned fires on State forest...	81
Table 3.1.b.2	Area (hectares) of forest types by tenure burnt by unplanned fires.....	82
Table 4.1.a	Area of forest where timber harvesting is excluded, by tenure .....	86
Table 4.1.b.1	Extent to which legally binding instruments address the risk of soil and water values for the management disturbance activities listed.....	91
Table 4.1.b.2	Extent to which non-legally binding instruments address the risk of soil and water values for the management disturbance activities listed .....	92
Table 4.1.b.3	Comprehensiveness and appropriateness of the knowledge base for the management of the risk of soil erosion .....	94
Table 4.1.b.4	The level (1 - 3) of processes applied to manage the risk to soil and water values .....	96
Table 4.1.b.5	Performance of discrete audit categories which impact on soil and water values 1996-97 to 2001-02.....	98
Table 4.1.b.6	Performance of discrete audit categories which impact on soil and water values 2003-04 to 2005-06.....	98
Table 4.1.b.7	Performance rating by tenure for specific audit questions assessing the impact of forest operations on soil or water values .....	101
Table 5.1.a	Estimated native forest biomass in Tasmania by vegetation type .....	103
Table 6.1.a.1	Volume of logs processed and timber produced in Tasmania ('000m <sup>3</sup> ).... .....	106

Table 6.1.a.2	Quantity of wood produced from public and private forests in Tasmania ('000 tonnes) .....	106
Table 6.1.a.3	Value of Tasmanian Wood and Paper Product Manufacturing Industry Subdivision (ANZSIC code 23).....	108
Table 6.1.b.1	Apiary site tenure.....	111
Table 6.1.b.2	Game processed in Tasmania.....	113
Table 6.1.b.3	Tree fern tags issued.....	114
Table 6.1.d.1	Wood products exported from Tasmania.....	119
Table 6.1.d.2	Volume of wood imports to Tasmania.....	120
Table 6.1.d.3	Wood products imported to Tasmania.....	120
Table 6.1.d.4	Tasmanian tree fern exports.....	121
Table 6.1.d.5	Tree fern export destinations .....	121
Table 6.1.d.6	Possum export destinations (no unit shown for number).....	122
Table 6.1.e	Tasmanian consumption and recycling of forest products (tonnes) ....	124
Table 6.2.a.1	Major organisations investing in forest management in Tasmania .....	127
Table 6.2.b.1	Forests and Forest Industry Council funded programs 1987-2005.....	130
Table 6.3.a.1	Area and proportion of total forests available for general recreation and tourism as at 30 June 2006.....	134
Table 6.3.b.1	Facilities available in forests for recreation and tourism activities 2005-06 .....	136
Table 6.3.b.2	Level of use for recreation and tourism activities – visitor numbers/estimates to recreational sites.....	138
Table 6.4.b.1	Number of places of non-indigenous cultural heritage in forests that are formally managed to protect the cultural values.....	145
Table 6.5.a.1	Employment in the Tasmanian Wood and Paper Product Manufacturing Industry Subdivision (ANZSIC code 23) .....	152
Table 6.5.a.2	Tasmanian paper industry employment.....	152
Table 6.5.b.1	Value of wages in the Tasmanian Wood and Paper Product Manufacturing Industry Subdivision (ANZSIC code 23).....	154
Table 6.5.b.2	Salary/wage rates in selected forestry occupations.....	155
Table 6.5.b.3	State and National AWOTE 2000-06 (\$ per week).....	156
Table 6.5.b.3	Injury Frequency Rate (number of claims per million hours worked)	156
Table 6.5.b.4	Fatality Frequency Rate (number of fatalities per million hours worked). .....	158
Table 7.1.a.1	Main legislation relevant to Sustainable Forest Management in Tasmania .....	161
Table 7.1.a.2	Main policies relating to forest management and conservation.....	163
Table 7.1.a.3	Scope of the ecologically sustainable forest management (ESFM) provisions in legal frameworks.....	165
Table 7.1.a.4	Legislative requirement to apply best practice for sustainable forest management activities by tenure category .....	166
Table 7.1.b.1	Major institutions or organisations which manage forests, and their responsibilities, major policies and operating budget.....	170
Table 7.1.b.2	Extent of the sustainable forest management provisions in non-legislative policy frameworks .....	172

Table 7.1.b.3	Area of forested land under local and regional management plans, cross-sectoral involvement .....	173
Table 7.1.b.4	Monitoring and compliance systems in place.....	174
Table 7.1.b.5	Number of FPOs authorised to undertake compliance and enforcement activities .....	175
Table 7.1.b.6	Certificates of compliance lodged with the Forest Practices Authority .....	177
Table 7.1.b.7	Percentage of performance rating achieved by tenure 2003-04 to 2005-06 .....	178
Table 7.1.b.8	Number of investigations undertaken by the Forest Practices Authority 1995-06 to 2005-06.....	180
Table 7.1.b.9	Cautions and Notices issued by PWS and DPIW field officers during period 2001-02 to 2005-06.....	182
Table 7.1.b.10	Area (hectres) of Tasmanian forest covered by AFS forest certification by tenure.....	183
Table 7.1.b.11	Number of organisations (agencies and companies) with environmental management systems in place.....	183
Table 7.1.e.1	Magnitude of Tasmanian forest and forestry research and development effort (2005-06).....	190
Table 7.1.e.2	Full-time personnel engaged in forest-related research and development in 2005-06 (FTE) .....	192
Table 1.1.a	Extent of forest types by tenure (a).....	194
Table 1.1.b(i)	Area of native forest types by growth stage and tenure groups (a) ....	196
Table 1.1.b(ii)	Distribution of growth stages of each native forest type within broad tenure groups.....	204
Table 1.1.b(iii)	Changes in distribution of growth stages of each forest type .....	206
Table 1.1.c (i)	Area of native forest type protected by IUCN category .....	208
Table 1.1.c (ii)	Area of native forest type protected by reserve class .....	210
Table 1.1.c (iii)	Change in reservation status of forest types .....	212
Table 1.1.c (iv)	Reservation status of native forest types by IBRA 4 biogeographic regions.....	214
Table 1.1.c (v)	Change in reservation status of native forest types relative to their estimated 1750 extent .....	222
Table 1.1.e (i)	Old Growth by forest type and tenure.....	224
Table 1.1.e (ii)	Old Growth by forest type and reserve type .....	226
Table 1.1.e (iii)	Change in reservation status of old growth by forest type.....	228
Table 1.2.a.1	Forest dwelling vertebrate fauna.....	230
Table 1.2.a.2	Forest dwelling plant species .....	234
Table 1.2.b(i)	Vascular Flora Species listed on TSP Act or EPBC Act .....	262
Table 1.2.b (ii)	Non-vascular flora species.....	272
Table 1.2.b(iii)	Proposed RFA priority flora species not listed under TPS Act or EPBC Act.....	273
Table 1.2.b (iv)	Flora species recommended for removal from Priority Species list ....	274
Table 1.2.b (v)	Proposed Priority Fauna Species .....	277

## ACRONYMS

A3P	Australian Plantation Products and Paper Industry Council
ABARE	Australian Bureau of Agricultural Research Economics
ABS	Australian Bureau of Statistics
AFG	Australian Forest Growers
AFS	Australian Forestry Standard
AGM	Autumn Gum Moth
AHO	Aboriginal Heritage Office
ANZSIC	Australian and New Zealand Standard Industrial Classification
AWOTE	Average Weekly Ordinary Time Earnings
CAR	Comprehensive, Adequate and Representative
CREA	Centre for Regional Economic Analysis
CRC	Cooperative Research Centre
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CWTH	Commonwealth
DAFF	Department of Agriculture, Fisheries and Forestry
DEH	Department of Environment and Heritage (now DEW)
DEW	Department of Environment and Water Resources
DFTD	Devil Facial Tumour Disease
DPAC	Department of Premier and Cabinet
DPIW	Department of Primary Industries and Water
DPIWE	Department of Primary Industries, Water and Environment (now DPIW)
DTAE	Department of Tourism, Arts and Heritage
EMS	Environmental Management System
EPBC	Environment Protection and Biodiversity Conservation
ESFM	Ecologically Sustainable Forest Management
FAFPESC	Forest and Forest Products Employment Skills Company
FCF	Forest Conservation Fund
FEF	Forest Education Foundation
FFIC	Forest and Forest Industry Council
FIAT	Forest Industries Association of Tasmania
FPA	Forest Practices Authority
FPB	Forest Practices Board (now FPA)
FPO	Forest Practices Officer
FPP	Forest Practices Plan
FT	Forestry Tasmania
FTE	Full Time Equivalent
GIS	Geographic Information System
GPS	Global Positioning System
HEC	Hydro Electric Commission
IBRA	Interim Biogeographic Regionalisation for Australia
IGP	Industry Gross Product
ISO	International Standards Organisation
IUCN	International Union for the Conservation of Nature

IVA	Industry Value Added
LTER	Long Term Ecological Research
MDC	Management Decision Classification
MDF	Medium Density Fibreboard
MLD	<i>Mycosphaerella</i> Leaf Disease
MRT	Mineral Resources Tasmania
MVEP	Tasmanian Monitoring Vegetation Extent Program
NAIDOC	National Aborigines and Islanders Day Observance Committee
NCAS	National Carbon Accounting System
NE	North East
NHT	Natural Heritage Trust
NPI	National Plantation Inventory
NR	Nature Reserve
NRM	Natural Resource Management
NW	North West
NVA	Natural Values Atlas
NVIS	National Vegetation Information System
PAMA	Public Authority Management Agreement
PFE	Permanent Forest Estate (Policy)
PNFE	Permanent Native Forest Estate
PFT	Private Forests Tasmania
PWS	Parks and Wildlife Service
RAA	Reserve Activity Assessment
R&D	Research and Development
RFA	Regional Forest Agreement
RNE	Register of the National Estate
RPDC	Resource Planning and Development Commission
SAC	Scientific Advisory Committee (under the TSPA)
SE	South East
SNC	Spring Needle Cast
STBA	Southern Tree Breeding Association
TAFE	Technical and Further Education
TALSC	Tasmanian Aboriginal Land and Sea Council
TASVEG	1:25000 statewide vegetation map of Tasmania
TCA	Timber Communities Australia
TCFA	Tasmanian Community Forest Agreement
TFS	Tasmania Fire Service
THPI	Tasmanian Historic Place Index
THR	Tasmanian Heritage Register
TSP	Threatened Species Protection
TSPA	Threatened Species Protection Act
TWWHA	Tasmanian Wilderness World Heritage Area
TWWHACC	Tasmanian Wilderness World Heritage Area Consultative Committee
WHA	World Heritage Area
WHS	Wildlife Habitat Strip

# **SUSTAINABILITY INDICATORS FOR TASMANIAN FORESTS 2001-2006**

## **EXECUTIVE SUMMARY**

The Sustainability Indicators reported here for the second five year review of the Tasmanian Regional Forest Agreement (RFA) vary in some instances from those reported at the first review and reported in the 2002 Sustainability Indicators Report. The new or amended indicators are a result of a national review of sustainability indicators for forests coordinated by the Montreal Process Implementation Group. The Montreal Process criteria and indicators were originally developed by the 12 countries that contain ninety per cent of the world's temperate and boreal forest. The national review was directed at improving the set of indicators, based on several years experience, so that it is more meaningful and practical in an Australian regional context. Tasmania contributed to this review. The national review also contributed to an international review of the Montreal Process criteria and indicators.

This report covers the period July 2001 to June 2006 and includes trend data either since the commencement of the RFA ten years ago or for the current five year reporting period. In some cases data are only available for shorter periods but in all cases the best available data have been reported. Data sources are referenced within each individual detailed indicator reports.

The key results under each criterion are summarized below.

### **Criterion 1: Conservation of Biological Diversity**

#### **Ecosystem diversity**

There has been no significant change (nil per cent) in the total mapped area of forest (native plus plantation) in Tasmania since 1996. Expansion in area of the plantation estate has essentially been the same as the decrease in area of native forest vegetation. While some plantation has been planted on previously cleared land this has been balanced by some native forest being cleared for a non-forest use, such as agriculture or essential infrastructure.

The mapped extent of native forest communities has decreased by 91,000 hectares, or 2.8 per cent since 1996, and by 53,000 hectares or 1.7 per cent since 2001. Most of the loss was in the wet eucalypt group of communities, which decreased by 52,000 hectares, or 5.9 per cent since 1996 and by 41,500 hectares or 3.1 per cent since 2001.

## Executive Summary

Plantation areas have expanded by 95,000 hectares, a 61.7 per cent increase since 1996, and by 41,500 hectares, a 21.2 per cent increase since 2001. Some of the new areas are on previously cleared agricultural land, and some on land newly cleared of native forest.

Forest tenure changes, particularly the creation of additional CAR reserves from State forest under the Tasmanian Community Forest Agreement (TCFA) in 2005, have caused the total area of mature forest in conservation reserves to increase at the expense of State forest.

Implementation of the comprehensive, adequate and representative (CAR) reservation framework agreed under the RFA has resulted in an extended system of public and private terrestrial CAR reserves. Within this framework, 1,465,000 hectares of forested land, or 47.0 per cent, of Tasmania's native forests, are now protected, compared with the 1996 reserved extent of 977,900 hectares or 30.5 per cent. This is an increase in reservation of 487,100 hectares, or 48.8 per cent since 1996, and of 194,000 hectares, or 15.3 per cent, since 2001.

In addition to the reservation of 1,417,000 hectares of native forest on public land, 48,000 hectares of forest on private land have been protected. Of the 50 native forest communities, 35 have at least 15 per cent of their estimated pre-1750 extent protected in reserves.

Within the reserve system 973,000 hectares of old growth forest, or 79.2 per cent of Tasmania's old growth forests, are now protected, including 9,000 hectares on private land. This is an increase of 291,000 hectares since 1996 and 122,000 hectares since 2001. Of the 42 old growth forest communities, 32 have at least 60 per cent reservation.

The public land component of old growth reservation under the TCFA is almost complete, with the process for reservation of several thousand hectares of additional Crown land and Hydro Tasmania land expected to be finalised in 2007. The approach to reservation of old growth forest on private land agreed to under the TCFA involved establishment of the Forest Conservation Fund, which became operational in 2006. The Forest Conservation Fund involves a tender process being carried out during 2007 to achieve voluntary reservation of old-growth forest on private land. These additions to the reserve system will bring the total old growth extent in reserves to the TCFA target of one million hectares.

About 1.4 per cent of the mapped area of old growth forest in 1996 has subsequently been harvested.

Over 70 per cent of Tasmania has native vegetation cover and there is a high degree of connectivity across the landscape. There is a higher proportion of forest in larger patches in Tasmania (more than 76 per cent) when compared with the national picture (50 per cent).

## Executive Summary

### Species diversity

A review of ecological information available to guide the management of vertebrate fauna and vascular plants has been completed. Partial or comprehensive information was available to assist forest managers for more than 90 per cent of vascular plants and more than 60 per cent of vertebrate fauna. This knowledge base continues to increase each year.

An additional 42 species have been listed under the *Threatened Species Protection Act 1995* of which 15 species are lichens. Nine species were de-listed and four species were rediscovered from extinct status.

RFA-Priority Species of flora that have undergone on ground recovery actions in order to reduce extinction risk over the last five year reporting period include *Eucalyptus gunnii* subsp. *divaricata*, *Tetratheca gunnii*, *Conospermum hookeri*, *Eucalyptus morrisbyi*, *Hypolepis distans*, *Epacris virgata*, *Epacris acuminata*, *Phebalium daviesii*, *Euphrasia gibbsiae* subsp. *psilantherea*, *Euphrasia fragosa*, *Euphrasia* aff. *diemenica* and *Hardenbergia violacea*. These actions include fencing/caging, weeding, reduction of competition, slashing or ecological burning to promote recruitment and establishment of *ex situ* holdings.

A number of species have declined further due to increased risk of extinction from ongoing threatening processes that are difficult to address at the species level. These include climate change (eg *Eucalyptus gunnii* subsp. *divaricata* and *Eucalyptus morrisbyi*), spread of *Phytophthora cinnamomi* (eg *Epacris limbata*, *Xanthorrhoea arenaria* and *X. bracteata*) and increased browsing pressure from feral animals (rabbits, deer and lyrebirds) and from increased browsing pressure from native animals whose numbers have increased as a result of increased food supply associated with agricultural activity.

For fauna, long-term monitoring of abundance has been carried out for the brushtail possum, the Tasmanian pademelon, Bennetts wallaby, the Tasmanian devil, the common wombat and the eastern quoll. There has been no decline in abundance for five of the six monitored species. The exception is the Tasmanian devil which in recent years has been severely affected by the Devil Facial Tumour Disease. Devil Facial Tumour Disease has now been confirmed in Tasmanian devils across more than half of Tasmania's mainland, and has been demonstrably linked to a 41 per cent decline in the population over the past ten years.

New population size data are available for the wedge-tailed eagle (overall population size and breeding population) and the swift parrot (population estimates). Excluding the poor flowering years 2000 and 2002, the trend in swift parrot population index appears to be reasonably steady. For the wedge-tailed eagle there are an estimated 458 territories, representing 86 per cent of the pre-settlement number. Former territories have been lost due to habitat modification, urban development and disturbance from human activity. Activity data indicates that only around 50 per cent of territories are occupied by

## Executive Summary

breeding pairs. By extrapolation, from the demography of similar species, the population is between 1200-1500 individuals with approximately half being mature-aged birds.

### **Genetic diversity**

A qualitative assessment of forest-associated species potentially at risk from isolation and the loss of genetic variation as a result of past human-induced events or natural events has been completed. A total of 270 vertebrate species and vascular plants were assessed as being potentially at risk ranging from moderate to high (104 species) to low (116 species) and unknown risk (50 species).

Formal measures to address the risk of loss of genetic variation have been initiated for many of Tasmania's threatened and priority species. They include development of Recovery Plans (which may include ex-situ breeding and establishment programs); habitat restoration and the "Seed Safe" seed collecting program for the Tasmanian Seed Conservation Centre, in partnership with the Kew Millennium Seed Bank. In addition a range of measures to manage habitat and populations of priority forest-associated species have been implemented through Tasmania's forest practices system.

Genetic resource conservation of indigenous commercial timber species is primarily through the CAR reserve system, implementation of the Permanent Native Forest Estate Policy and implementation of the Forest Practices Code. Introduced commercial timber species such as *Pinus radiata* is maintained through the National Genetic Resource Conservation Centre at Mount Gambier while the genetic resource of *Eucalyptus nitens* is maintained through numerous progeny trials on public and private land.

### **Criterion 2: Maintenance of Productive Capacity of Forest Ecosystems**

The area of public native forest, which is potentially available for timber production, has decreased, by about 15 per cent over the last five years. Public forest area potentially available for harvesting as at June 2006 is 607,000 hectares out of total public forest area of 2,335,000 hectares. The reduction in harvestable public forest area is partly due to the transfer of State forest previously available for wood production to the reserve system as a result of the TCFA in 2005.

Data on the area of private forest available for timber production are not available.

The area of hardwood plantation is now 158,900 hectares following an increase of 35 per cent or about 41 000 hectares during 2001 to 2006. On the other hand the area of softwood plantation decreased by 8,900 hectares to 71,500 hectares due partly to conversion to hardwood plantation.

On public forest the actual average eucalypt sawlog cut for the period 2001-2005 is below the determined sustainable yield of 350,000 cubic metres. On private land there is no sustainable sawlog cut determined; however, the annual all products harvested are within the predicted woodflow estimate for each of the five years 2001 to 2005.

## Executive Summary

Non-timber forest products assessed under this criterion included honey, tree ferns, seeds and game. While there has been an increase in honey production over a long period of time (Indicator 6.1.b) the number of sites and hives on public forest has remained relatively stable since the commencement of the RFA.

The sale of tree ferns is now regulated under the *Forest Practices Act 1985* through a tagging system and is well within sustainable levels. An estimate of the number of tree ferns across tenure has been completed and the number of tags issued for tree ferns harvested is reported by the Forest Practices Authority. Harvesting is currently only allowed on areas of native forest being converted to another land use.

Private collectors and Forestry Tasmania collect seeds, principally for their own use in native forest regeneration, propagating nursery stock and the establishment of plantations. The amount of seed collected is influenced strongly by natural seeding cycles.

While the number of wallabies or brushtail possums harvested for crop protection or recreational hunting remains relatively stable in recent years, the sale of meat or skins fluctuates widely with market demand. On the other hand the harvest of deer has steadily increased over the last ten years.

Ensuring the regeneration of native forest or the re-establishment of plantation is an essential requirement for sustainable long-term wood supply. Forest Practices Authority (FPA) annual audits indicate that over the five year reporting period on average the regeneration of native forests or re-establishment to plantations has been achieved across tenures. The standards achieved on State forest were particularly good.

### **Criterion 3: Maintenance of Ecosystem Health and Vitality**

Native and exotic pests (vertebrate and invertebrate), pathogens and weeds can adversely affect the health and vitality of plantations and native forests as can abiotic stresses such as extreme weather events, fire and nutrient imbalances.

Browsing of young planted seedlings by native herbivores remains the biggest forest health and vitality issue in young eucalypt plantations. In the three years 2000 to 2003, control measures were required on 74 per cent of young plantations on State forest. Browsing herbivore control using 1080 poison ceased on State forest at the end of 2005 being replaced by shooting and trapping. A range of insects including chrysomelids, scarabs, psyllids, sawflies, moths and weevils invaded young eucalypt plantations. Insect control, by spraying was implemented when pre-determined damage thresholds were approached. Once plantations were well-established there were few health problems.

As for the previous five years spring needle cast and bark stripping by wallabies and brushtail possums remain the major problems affecting the pine plantation estate.

## Executive Summary

There is increasing evidence of foxes in Tasmania. This constitutes both soft evidence such as sighting reports and hard evidence as constituted by scats, carcasses and blood. Many Tasmanian small vertebrates are potentially at risk from fox predation and the fox would provide increased competition for food with large raptors.

The root-rot pathogen, *Phytophthora cinnamomi*, remains the most significant biotic threat to the health of the native forest in Tasmania. No new susceptible host plant species have been recorded over the past five years but four species are currently being evaluated. Myrtle wilt caused by the native pathogen *Chalara australis* is the most significant factor affecting the health and vitality of *Nothofagus cunninghamii*-dominated rainforest.

Fire is managed co-operatively by Tasmanian agencies, including the Parks and Wildlife Service, Forestry Tasmania and the Tasmania Fire Service, under the Inter-Agency Fire Management Protocol. This operates seamlessly across land tenures and provides a best practice model for such activity in Australia.

Planned fires are defined as those started in accordance with a fire management plan or some other type of planned burning program or wildfire response procedure. Reasons for such fires include: fulfilling the ecological requirements of flora and fauna; the protection of life and property; maintaining and promoting sustainable production values; maintaining cultural resources and practices. The area of planned fires burnt each year on State forest has shown a gradual decrease during the reporting period. The majority of the planned burns on State forest, apart from reducing post-logging fuel loads, created a suitable seed bed for the regeneration of native forest or the establishment of new plantations.

The five wildfire seasons 2001-02 to 2005-06 were relatively mild in comparison to some previous seasons. However, the long-term average for forest area burnt by wildfire was exceeded in both 2002-03 and 2003-04.

### **Criterion 4: Conservation and Maintenance of Soil and Water Resources**

Soil and water values are protected on forest land in Tasmania through a range of measures, with two key mechanisms being the *Forest Practices Code 2000* and the *Tasmanian Reserve Management Code of Practice 2003*.

During the reporting period 2001–06 there has been an increase of 117,000 hectares or eight per cent of forest across all tenures where timber harvesting has been excluded reducing potential disturbance to water supply catchments. The total area of forest land excluded from timber harvesting across all categories of land in 2006 is now 1,673,000 hectares.

Tasmania has many catchments that are used for water harvest for domestic or industrial use, although the majority of these are not explicitly reserved as water catchment areas.

## Executive Summary

Two reserves where the role as drinking water catchments is explicitly recognised are Wellington Park and Mt Field National Park.

Assessments for soil and water risks occur when a forest activity is carried out under the *Forest Practices Act 1985* irrespective of land tenure or forest type. Assessments are also commonly undertaken on all public forests and large industrially managed private forests in relation to road and other site developments (eg major recreation facilities, ongoing maintenance or infrastructure) not specified under the *Forest Practices Act 1985*. Assessments are less rigorous for non-forestry activities on private land. These assessments on public and private forest determine where an activity can proceed and under what conditions and forest practices set out in legally and non-legally binding instruments.

Forestry activities potentially impacting on soil and water values are generally subject to both internal and external audit. Conservation forest, other crown lands and private forests are not externally audited unless subject to a Forest Practices Plan. The Forest Practices Authority (FPA) sets a high acceptable standard to be achieved in implementing soil and water protection requirements. The FPA audits roading, bridge construction, harvesting, log landings, stream reserve integrity and site preparation. In each of the five years under review FPA standards were achieved on average across all tenures.

### **Criterion 5: Maintenance of Forest Contribution to Global Carbon Cycles**

The National Carbon Accounting System (NCAS) was developed by the Australian Greenhouse Office for national reporting of carbon emissions and sinks for land-based (largely forestry and agricultural) activities. The data cover native woody vegetation only since this is the focus of the Kyoto Protocol, which NCAS was established to support.

The NCAS provided interim estimates of total forest biomass in 2001 for the 2002 Sustainability Indicators Report, based on the biomass at maturity (ie in mature condition). These data have been updated and the time-series extended to 2005. Therefore, there is comparability in estimates over time, and hence change can be assessed.

The total biomass of woody vegetation between 2001 and 2005 increased from 766 million tonnes to 774 million tonnes. The differences in total biomass between 2001 and 2005 are minor and not significant.

### **Criterion 6: Maintenance and Enhancement of Long Term Multiple Socio-Economic Benefits to Meet the Needs of Societies**

#### **Production and consumption**

The production of hardwood sawlogs gradually increased from 2001 to 2005 dropping back to near 2001 levels in 2006. Production of pulpwod from native forest decreased

## Executive Summary

over the reporting period with a corresponding increase in pulpwood from eucalypt plantations. Timber production from softwood plantations remained at about the same level during the reporting period.

The Australian Bureau of Statistics (ABS) has not reported honey production since 2001. However, the number of apiary sites and hives operating in Tasmania appears to have remained relatively stable over the five year reporting period indicating that honey production, subject to seasonal conditions, has remained at similar levels to the preceding five years. The sale of tree ferns is now regulated with sales running at 45,000 – 65,000 ferns each year subject to market demand.

There is an emerging market for forest-based services related to environmental credits but it is yet to commence in Tasmania. Recreation and tourism is an important forest based service in Tasmania with considerable socio-economic benefits to Tasmania. However, its value, while in the hundreds of millions of dollars, is not able to be quantified.

Woodchips and lower valued products are the dominant wood products exported from Tasmania in terms of value (74 per cent) and volume; predominately to Asian economies. The second most important wood product exported in the reporting period was medium density fibreboard (MDF). However, a fire in 2006 destroyed Tasmania's only MDF plant and a decision was made by the owners to close the plant. Pulp is the most significant wood product imported.

The principal non-wood forest products exported are tree ferns with the biggest market being in the United Kingdom.

White office paper, newsprint, cardboard and liquid paperboard are all recycled within Tasmania although data on actual quantities consumed and recycled are limited. For example, ABS figures indicate that in 2003, 83 per cent of Tasmanian households were recycling 'paper and cardboard' and more than 64 per cent of newsprint consumed was recycled.

### **Investment in the forest sector**

A number of government bodies, publicly listed companies, private companies, associations and individuals have, wholly or as part of other activities, invested in forest management in Tasmania during the last five years. However, comprehensive data on the level of this investment across organisations are not readily available.

The 2005 Tasmanian Community Forest Agreement provided \$250 million to support programs which "enhance forest conservation and the development of forest industries". Features of this Agreement include specific programs to assist private industry to retool existing mills and improve efficiency and competitiveness as a response to changing markets and in wood supply. The Tasmanian Government, in partnership with private industry, research and educational organisations supported a wide range of initiatives to facilitate sustainable forest management, enhance the State's natural and cultural heritage,

## Executive Summary

improve wood and fibre performance, increase efficiency and environmental performance of wood and paper processing, and promote value adding for wood and paper products.

### **Recreation and tourism**

There has been little change in the availability of public forest for recreation and tourism since that reported in the 2002 Sustainability Indicators Report. However, the available recreation facilities have improved. The area has increased on conservation reserve and reduced on State forest largely as a result of the TCFA. The total area of forest available for recreation and tourism across tenures is now 3,353,000 hectares.

There has been an increase of 44,000 hectares in the reservation of areas of high quality wilderness areas identified in the RFA since 2002. Ninety-seven per cent of all high quality wilderness areas are now protected within reserves.

There has been an increase in the number and type of facilities available for recreation and tourism across tenures.

Two new tourism locations have been opened by Forestry Tasmania since 2001-02. These are the Scottsdale Eco Centre at Scottsdale in the north east, and Dismal Swamp on State forest about 30 kilometres south west of Smithton in the north west of the State.

A major visitor facility development program, the Nature Based Tourism Development Program, funded from a variety of local, state and federal sources was completed in 2003. Various new facilities were constructed including new visitor centres at Hastings Caves, Mt Field, Freycinet and Narawntapu National Parks and upgraded signage and promotion of the 60 Great Short Walks across tenures.

The basic visitor trend across the whole National Park and State forest system has been growth throughout 2001-02 and 2002-03, with visitor numbers peaking in 2003-04 or 2004-05, followed by a fall in numbers in 2005-06. This growth, peak and decline have moved in line with visitor numbers to Tasmania (as collected by Tourism Tasmania).

### **Cultural, social and spiritual needs and values**

Over the five year period from July 2001 to June 2006, 427 new Aboriginal heritage places were identified in the course of surveys required under the *Forest Practices Act 1985*.

Management plans for ten national parks and reserves approved in the reporting period recognise Aboriginal cultural heritage values and include strategies for management in consultation with the Aboriginal community. In particular, the Arthur Pieman Conservation Area Management Plan 2002 aims to “facilitate and enrich Aboriginal community use of the area, its resources and educational opportunities.”

## Executive Summary

As at 30 June 2006 about 49,000 hectares of State forest is zoned for indigenous and non-indigenous cultural heritage special management. This compares with about 37,700 hectares zoned for equivalent cultural heritage management in 2001.

In 2005 a further two areas of land – Cape Barren Island (42,706 hectares) and Clarke Island (8,149 hectares) - were transferred to the Aboriginal Land Council of Tasmania, making a total of 15 areas returned to date. Unlike other land transfers, Cape Barren Island contains large areas of forest.

Under the *Nature Conservation Act 2002*, 29 places are designated Historic Sites covering a total area of 16,074 hectares of which approximately 4,320 hectares are forested. The Forest Practices Code requires that all non-indigenous sites found in the preparation of a Forest Practices Plan are reported. As a result an additional 518 historic sites have been identified and managed in wood production forests since 2001.

The Port Arthur Historic Site and the North East Peninsula, Recherche Bay are now on the National Heritage Register. Both Darlington in Maria Island National Park and the Coal Mines Historic Site have been nominated for this Register and are also part of a proposed serial listing of Australian convict sites that is being nominated for inclusion on the World Heritage List.

All public land forest managers maintain a dialogue with the Tasmanian Aboriginal Land and Sea Council and consult on management of Aboriginal sites.

The Forest Practices Authority continues to employ an Aboriginal person as a full-time Senior Aboriginal Heritage Officer. During the report period all public land forest managers have taken steps to provide opportunities for Aboriginal trainees. In 2004 the Parks and Wildlife Service introduced a new two year Aboriginal trainee program involving five young Aboriginal people. Forestry Tasmania has established a bursary for an Aboriginal cadetship at the University of Tasmania and approved an internal technical forester traineeship for an indigenous person.

### **Employment and community needs**

Employment is an important measure of the contribution of forests in meeting community needs. The most comprehensive and accurate source of direct and indirect forestry employment data is a 2003 report by the Forest and Forest Products Employment Skills Company (FAFPESC- now known as ForestWorks). The FAFPESC report identified that there were 10,693 people directly employed in the forest industry in 2003. There are no specific figures available on indirect employment resulting from the forestry industry in Tasmania, although it has been reported that Tasmanian forest industry multipliers from input-output analysis vary from 1.8 to 2.3.

The Australian Bureau of Statistics reported that in 2004-05 wood and paper product manufacturing was the second highest source of both employment, and wages and salaries for manufacturing in Tasmania.

## Executive Summary

Salary levels for a range of forest-related positions over the last five years have increased at an average of approximately 13 per cent over the period 2001 to 2006. This compared with an increase in the average Tasmanian annual wage of 19.6 per cent over the same period.

Injury frequency rates have generally decreased across the forestry and forest product processing sectors during the reporting period. The improvements in injury frequency rates may be due to the emphasis placed on safety management by forestry companies; post-accident investigations leading to improved practices; awareness, promotional and enforcement activities relating to safety management by Workplace Standards Tasmania; and the increasing mechanisation of forest operations. Trends in the Fatality Frequency Rate match the declining trend shown in Injury Frequency Rate in the Forestry and Logging Sector.

The Cooperative Research Centre (CRC) for Forestry has recognised that Australia's forest industries are undergoing rapid change, as are the perceptions of different groups about forestry. It has been acknowledged that it is essential to understand the social and economic implications of these industry changes and to develop effective community engagement processes. To this end the CRC for Forestry has commissioned the Communities Project to be undertaken in Tasmania. The Communities Project will develop an understanding of the social and economic dimensions of forest industries in Tasmania.

Tasmanian Aboriginal communities are not highly dependent now on forests and/or forest products and/or services and therefore changes to forests will have limited impact on their social and economic status. However, the Tasmanian Government, public agencies and private forest managers recognise the importance of forests and forest sites containing cultural objects and sites of significance to Aboriginal communities and, where practical, engage these communities in management planning and operations.

### **Criterion 7: Legal, Institutional and Economic Framework for Forest Conservation and Sustainable Management**

Tasmania has a strong legal framework to support forest conservation and sustainable management. During the last five years to June, 2006 the principal changes to the legislative and policy framework supporting forest management have been an upgrading of legislation for reserve declaration and reserve management in 2002; amendments to the *Forest Practices Act 1985* to ensure greater independence of the Forest Practices Authority and to provide for improved transparency in its operation; the development of the Tasmanian Community Forest Agreement in 2005 which increased the area of forest under conservation management and provided support to the timber industry in their progressive transition to dependence on smaller sawlogs from regrowth forest and plantations; and the review of the policy for maintaining a Permanent Native Forest Estate which resulted in higher retention levels being set for the maintenance of the permanent native forest estate.

## Executive Summary

The institutional framework in Tasmania supporting sustainable forest management includes forest district, park and property management plans, operational plans, codes of practices, environmental management systems and forest certification schemes. Monitoring of the implementation of plans and use of available enforcement measures when and where necessary ensure high standards of operational management are maintained. Major developments during the reporting period on conservation forest include the completion of a further ten management plans to cover about 70 per cent of Tasmanian parks and reserves and the development and implementation of the Reserve Management Code of Practice. The *Tasmanian Wilderness World Heritage Area Management Plan 1999* was awarded the 2003 Planning Institute of Australia's state and national Award of Excellence in the category for Environmental Planning/Conservation. On multiple use public forest and large industrial commercial forest four organisations now have environmental management systems certified to ISO 14001, two organisations have gained certification against the Australian Forestry Standard for sustainable forest management and one private organisation has also gained chain of custody certification. Forestry Tasmania has achieved and maintained certification to ISO 14001 and the Australian Forestry Standard in managing the State forest estate.

Government investment, taxation and trade policies impact on the development of and investment in, forest growing and timber processing activities and most of these policies are set on a national basis. There is a clear commitment from governments to maintain and strengthen Tasmania's rural and regional economies, communities and the environment in which they operate by encouraging innovation and investment through the development of consistent and non-discriminatory economic policies in order to support sustainable management of forests.

Government agencies and private industrial forest companies have formal and informal systems in place which contribute to the level of knowledge necessary to measure, monitor and report on the sustainability of forests in Tasmania. Data for forest on public land are maintained by Forestry Tasmania, while equivalent data for industrial forests on private land are collated by Private Forests Tasmania, which also receives some data from smaller landowners. Forestry Tasmania's program of photo-interpreted structural forest-typing progressively remaps State forest on a rolling 20-year cycle at a scale of 1:25 000. Private Forests Tasmania has implemented a two year satellite imagery program based on Quickbird high resolution satellite imagery for most private forest areas to update native forest area change.

In order to meet the need to report on the nature and extent of native vegetation in Tasmania, the Tasmanian Vegetation Monitoring and Mapping Program commenced a project entitled Monitoring Vegetation Extent Project (MVEP) in April 2005.

The *State of the Tasmanian Wilderness World Heritage Area Report* prepared by the Parks and Wildlife Service in 2004 was awarded the 2005 Australasian Evaluation Society's Caulley Tulloch Prize for best publication in evaluation. The report was also selected as a finalist in the Australian 2006 Banksia Awards for environmental excellence.

## Executive Summary

A variety of non-wood values are surveyed before harvest across State forest and private tenures, as required by the Forest Practices Code. Surveys of natural and cultural values are undertaken prior to proposed activities in national parks and reserves as required by the Tasmanian Reserve Management Code of Practice.

A stratified sample of up to 15 per cent of Forest Practices Plans across the full range of forest operations on private and public land is audited independently each year. The audit checks 120 specific factors, covering the standard of the plan, forest practices assessments and procedures, and operational performance.

The implementation of requirements under certification schemes on commercial forest are externally audited on a regular basis.

Reporting of State trends in sustainable forest managements is achieved through the State of the Forests and the State of the Environment five-yearly reports.

A scientific understanding of the characteristics and functions of Australian forest ecosystems is needed to underpin their management. In 2005-06 there were 147 personnel engaged in forest-related research at a cost of \$12.4 million. This research expenditure is spread across government agencies, the forest industry and academia. Much of the current research is conducted through the CRC for Forestry based in Hobart. There were 537 research publications produced during the last five years. The majority of the research reports (508 in all, or 95 per cent) are in four of the nine Priority Areas of Research (Biodiversity Conservation and Management, Pests, Silviculture Techniques, and Soil and Water Conservation).

## INTRODUCTION

The Tasmanian Regional Forest Agreement (RFA) between the State of Tasmania and the Commonwealth of Australia was signed on 8 November 1997. Clause 91 of the RFA required the Parties to develop agreed sustainability indicators. A key requirement was that the indicators should have regard to the Montreal Process criteria and indicators as amended from time to time. The internationally recognised Montreal Process has a membership of 12 countries, including Australia, which manages 90 per cent of the world's temperate and boreal forests. The criteria and indicators under this process provide a common understanding for sustainable forest management and an agreed framework for assessing the state of Tasmania's forests.

The Forest Practices Authority is required to report five yearly on the state of Tasmania's forests under section 4Z of the *Forest Practices Act 1985*.

This report will serve public reporting requirements for the review of the Tasmanian RFA and provide the basis for the 2007 Tasmanian State of the Forests report.

In 2002, under the seven Montreal Process criteria Tasmania publicly reported against 41 indicators and 11 research indicators.

Since 2002 there have been two significant events that will impact on data presented in this report.

Firstly, the 2005 Tasmanian Community Forest Agreement resulted in a number of amendments to the RFA, in particular, increased forest areas being managed for conservation values.

Secondly, the Montreal Process indicators, for application across regional Australia, have been subject to major review. Experience gained over the last 10 years implementing the Montreal Process criteria and indicators has enabled Australia, with significant Tasmanian input, to refine the indicators so they are more meaningful for use in Australian forests. Some indicators have largely remained as in 2002 but others have changed to improve their value to forest managers and some new indicators have been introduced to improve our capacity to report against sustainable forest management. While forest research continues, research indicators were no longer considered necessary with research results being incorporated into improved management practices and subsequently reported against the respective indicators.

In this 2007 report, 44 indicators are reported against covering a wider range of parameters than in the past. Criterion 1, *Conservation of Biological Diversity*, has been expanded by the inclusion of genetic diversity. Criterion 4, *Conservation and Maintenance of Soil and Water Resources*, has also been improved with this criterion now focusing on the implementation of scientifically sound processes to maintain soil

and water values. In Criterion 6, *Maintenance and Enhancement of Long Term Multiple Socio-Economic Benefits to Meet the Needs of Societies*, has also expanded to include parameters such as forest-based services, recycling of forest products, the importance of forests to people and the resilience of forest dependent communities to changing conditions.

The content of this report was primarily provided by the following agencies:

- Forest Practices Authority
- Department of Infrastructure, Energy and Resources
- Department of Premier and Cabinet
- Department of Primary Industries and Water
- Department of Tourism, Arts and the Environment
- Forestry Tasmania
- Private Forests Tasmania
- Australian Government Department of Agriculture, Fisheries and Forestry.

Other Tasmanian and Commonwealth agencies also contributed information when requested by the Working Group. Private-forestry sector information was provided through Private Forests Tasmania. Data reported, to the extent possible, are for the period July 2001 to June 2006 however in all cases the best available data (which may be for shorter periods) have been used. Where data prior to 2001 have been included they have been to assist in illustrating longer term trends.

The format of this report is to follow the indicator numbering system and indicator name detailed below. Large tables have been included as Appendices to the report with the same indicator number.

## **CRITERIA AND THE INDICATORS FOR EACH CRITERION IN THIS REPORT:**

### **Criterion 1: Conservation of Biological Diversity**

#### **1.1 Ecosystem diversity**

- **1.1.a** Area by forest by forest type and tenure
- **1.1.b** Area of forest by growth-stage
- **1.1.c** Area of forest in protected area categories
- **1.1.d** Fragmentation of forest cover
- **1.1.e** Area of Old Growth by Forest Type by Reservation Status

#### **1.2 Species diversity**

- **1.2.a** Forest-dwelling species for which ecological information is available
- **1.2.b** The status of forest-dwelling species at risk of not maintaining viable breeding populations, as determined by legislation or scientific assessment
- **1.2.c** Representative species from a range of habitats monitored at scales relevant to regional forest management

### **1.3 Genetic diversity**

- **1.3.a** Forest associated species at risk from isolation and the loss of genetic variation, and conservation efforts for those species
- **1.3.b** Native forest and plantations of indigenous species which have genetic resource conservation mechanisms in place

## **Criterion 2: Maintenance of Productive Capacity of Forest Ecosystems**

- **2.1.a** Native forest available for wood production, area harvested, and growing stock of merchantable and non-merchantable tree species
- **2.1.b** Age class and growing stock of plantations
- **2.1.c** Annual removal of wood products compared to the volume determined to be sustainable for native forests and future yields for plantations
- **2.1.d** Annual removal of non-wood products compared to the level determined to be sustainable
- **2.1.e** The area of native forest harvested and the proportion of that effectively regenerated, and the area of plantation clearfell harvested and the proportion of that effectively re-established

## **Criterion 3: Maintenance of Ecosystem Health and Vitality**

- **3.1.a** Scale and impact of agents and processes affecting forest health and vitality
- **3.1.b** Area of forest burnt by planned and unplanned fire

## **Criterion 4: Conservation and Maintenance of Soil and Water Resources**

- **4.1.a** Area of forest land managed primarily for protective function
- **4.1.b** Management of the risks of soil erosion and the risks to soil physical properties, water quantity and water quality in forests

## **Criterion 5: Maintenance of Forest Contribution to Global Carbon Cycles**

- **5.1.a** Contribution of forest ecosystems and forest industries to the global greenhouse gas balance

## **Criterion 6: Maintenance and Enhancement of Long-term Multiple Socio-economic Benefits to Meet the Needs of Societies**

### **6.1 Production and consumption**

- **6.1.a** Value and volume of wood and wood products
- **6.1.b** Values, quantities and use of non-wood forest products
- **6.1.c** Value of forest based services
- **6.1.d** Production and consumption and import/export of wood, wood products and non-wood products
- **6.1.e** Degree of recycling of forest products

### **6.2 Investment in the forest sector**

- **6.2.a** Investment and expenditure in forest management
- **6.2.b** Investment in extension and use of new and improved technologies

### **6.3 Recreation and tourism**

- **6.3.a** Area of forest available for general recreation/tourism
- **6.3.b** Range and use of recreation/tourism activities available

### **6.4 Cultural, social and spiritual needs and values**

- **6.4.a** Area of forest to which Indigenous people have use rights that protect their special values and are recognised through formal and informal management regimes
- **6.4.b** Registered places of non-Indigenous cultural values in forests that are formally managed to protect those values
- **6.4.c** The extent to which Indigenous values are protected, maintained and enhanced through Indigenous participation in forest management
- **6.4.d** The importance of forests to people

### **6.5 Employment and community needs**

- **6.5.a** Direct and indirect employment in the forest sector
- **6.5.b** Wage rates and injury rates within the forest sector
- **6.5.c** Resilience of forest dependent communities to changing social and economic conditions
- **6.5.d** Resilience of forest dependent Indigenous communities to changing social and economic conditions

**Criterion 7: Legal, Institutional and Economic Framework for Forest Conservation and Sustainable Management**

- **7.a** Extent to which the legal framework supports the conservation and sustainable management of forests
- **7.b** Extent to which the institutional framework supports the conservation and sustainable management of forests
- **7.c** Extent to which the economic framework supports the conservation and sustainable management of forests
- **7.d** Capacity to measure and monitor changes in the conservation and sustainable management of forests
- **7.e** Capacity to conduct and apply research and development aimed at improving forest management and delivery of forest goods and services

## **CRITERION 1: CONSERVATION OF BIOLOGICAL DIVERSITY**

### **1.1 Ecosystem Diversity**

This sub-criterion measures the current extent of forest cover, by forest type and growth stage, and its distribution across land tenures and reserve types. The focus on the area and growth stage of each forest community provides a measure of the extent and diversity of ecosystems, while the focus on land tenure and reservation status provides a measure of the comprehensiveness, adequacy and representativeness of the conservation reserve system.

Land tenure broadly reflects the intended use and legislative rights and responsibilities under which land and forests are managed. The tenure groups reported in this sub-criterion reflect the public-land classification system implemented by the *Regional Forest Agreement (Land Classification) Act 1998*.

Land tenure is recorded as at 30 June 2006, and is based on Department of Primary Industries and Water (DPIW) land classification mapping.

Reservation status for conservation purposes is more specifically reported under Indicator 1.1.c. Reservation status is recorded as at 30 June 2006 and is based on the DPIW's CAR Reserve System dataset. This spatial layer is a composite of public and private reserve data across all land tenures.

The Ecosystem Diversity sub-criterion is broken down into five indicators, each reported separately below.

#### **INDICATOR 1.1.a EXTENT OF AREA OF FOREST TYPES**

The extent of each of the different vegetation communities is a measure of the forests' biological diversity at the species and ecosystem levels.

As part of the development of the Tasmania Regional Forest Agreement (RFA) in 1996, the State's native forest was classified and mapped into 50 communities as a basis for assessing their extent and conservation status and for monitoring change. In 2001 the original 1996 RFA forest maps were compared with mid-2001 maps providing an updated forest extent dataset for the 2002 Sustainability Indicators Report. For the current assessment, the revised maps developed for the 2002 report are used as the baseline for measuring changes in extent of forest vegetation in the last reporting period. Change data are reported as at the first quarter of 2005 – not mid 2006 - due to limitations in the availability of satellite imagery.

Since 1996 the Tasmanian and Australian Governments have endorsed the reclassification of the Inland *Eucalyptus amygdalina* forest community into two separate forest types, hence creating a 51<sup>st</sup> forest community. However, this change has been too recent to reflect in the current datasets.

Under the RFA, a comprehensive, adequate and representative (CAR) forest-reserve system was established under a revised land-tenure system to ensure that each forest community is securely protected for conservation purposes. Some forest communities are also protected on public land outside the reserve system wherever prudent and feasible. In addition, forest communities identified as rare, vulnerable or endangered (threatened) in the Regional Forest Agreement process are protected from clearance and conversion on both public and private land, under the Forest Practices System. Under the *Maintenance of a Permanent Native Forest Estate Policy* all of Tasmania's native forests are to be managed so as to maintain at least 95 per cent of their 1996 statewide extent as an extensive and permanent native forest estate.

Changes in the extent of forest communities have been mapped by comparing satellite imagery from two points in time – 2000 and 2005. Changes detected from this process have been checked for vegetation type using TASVEG, the currently maintained vegetation map of Tasmania. The nature of change was validated using a combination of available data including private and public forest plantation data, Forest Practices Plans (FPPs), aerial photography, aerial inspection and high resolution satellite imagery where available. All patches that were greater than 20 hectares in size were validated through such methods.

Of the patches of change less than 20 hectares, which remained after an initial weeding out of obvious false change, some were validated automatically using other Geographic Information System (GIS) layers such as FPPs and plantation. Patches less than 20 hectares that still remained not validated were inferred with an amount of change by sampling the amount of change occurring in other polygons.

This resulted in a decrease in extent of native forest in the RFA vegetation community mapping, indicated by the Monitoring Vegetation Extent Project (MVEP) data source alone, as 22,000 hectares, of which 3,000 hectares have been derived from unverified (statistically inferred) change. The inferred proportions of change have been incorporated into the figures presented throughout Criterion 1.1 of this report.

Following categorisation of changes detected, the information was applied to the 2001 RFA vegetation maps to develop a revised forest extent map as at the first quarter of 2005.

The changes in the extent of communities reflected in this indicator are not readily comparable with data used by the Forest Practices Authority for reporting on the Permanent Native Forest Estate (PNFE). The PNFE data give the gross areas planned and approved for future harvesting or clearing for agriculture based on multi-year Forest Practices Plans. Approved Forest Practices Plans may not be implemented yet or the land manager for a variety of reasons may decide not to implement a particular plan. Forest

Practices Plans indicate the gross area of forest, all of which may not be harvested or cleared. Indicator 1.1.a maps the actual change in net area from validated satellite imagery, but does not fully reflect all clearing to 2006 due to the lack of a statewide 2006 satellite image and due to cloud cover in the 2005 image masking some changes. Thus, the Indicator 1.1.a data underestimate, and the PNFE data overestimate the extent of change.

Data for each forest community as at the first quarter of 2005 are summarised in Table 1.1.a below and in greater detail in Appendix 1.1 - Table 1.1.a. To reflect the resolution of forest mapping, areas are generally quoted to the nearest 1,000 hectares; areas smaller than 1,000 hectares are quoted to the nearest 100 hectares and areas smaller than 100 hectares are quoted to the nearest 10 hectares.

The main trends evident from the data are:

- There has been no significant change (nil per cent) in the total mapped area of forest (native plus plantation) in Tasmania since 1996. Expansion in area of the plantation estate has essentially been the same as the decrease in area of native forest vegetation. While some plantation has been planted on previously cleared land this has been balanced by some native forest being cleared for a non-forest use, such as agriculture or essential infrastructure.
- The mapped extent of native forest communities has decreased by 91,000 hectares, or 2.8 per cent since 1996, and by 53,000 hectares or 1.7 per cent since 2001. Most of the loss was in the wet eucalypt group of communities, which decreased by 52,000 hectares, or 5.9 per cent since 1996 and by 41,500 hectares or 3.1 per cent since 2001.
- The native forest communities for which the biggest area decreases since 2001 were recorded were tall *Eucalyptus obliqua*, tall *E. delegatensis*, *E. regnans*, silver wattle, dry *E. obliqua*, Coastal *E. amygdalina* dry sclerophyll, *E. amygdalina* forest on dolerite, and tall rainforest.
- Eleven native forest communities decreased in area by more than 2 per cent since 2001: four of these are wet eucalypt forests, four are dry eucalypt forests and three are non-eucalypt forests.
- Plantation areas have expanded by 95,000 hectares, a 61.7 per cent increase since 1996, and by 41,500 hectares, a 21.2 per cent increase since 2001. Some of the new areas are on previously cleared agricultural land, and some on land newly cleared of native forest.

**Table 1.1.a Extent of forest by tenure (a)**

RFA forest vegetation community group	Land Classification (Tenure)					Area change since 1996 %	Area change since 2001 %
	Conservation Reserves (ha) (b)	Other State forest (ha) (c)	Other publicly managed land (ha)	Private freehold land (ha)	TOTAL (ha)		
Dry eucalypt forests	433,000	345,000	55,000	711,000	1,544,000	-1.7%	-1.2%
Wet eucalypt forests	229,000	462,000	11,000	119,000	821,000	-5.9%	-3.1%
Sub-alpine eucalypt forests	47,000	8,000	3,000	7,000	65,000	0.0%	0.0%
Non-eucalypt forests	413,000	210,000	15,000	49,000	686,000	-1.9%	-1.2%
<b>Native forest Total</b>	<b>1,121,000</b>	<b>1,026,000</b>	<b>85,000</b>	<b>885,000</b>	<b>3,116,000</b>	<b>-2.8%</b>	<b>-1.7%</b>
Plantation	1,000 <sup>(d)</sup>	102,000	800	133,000	237,000	+61.7%	+21.2%
<b>TOTAL</b>	<b>1,122,000</b>	<b>1,128,000</b>	<b>85,000</b>	<b>1,018,000</b>	<b>3,353,000</b>	<b>0.0%</b>	<b>-0.3%</b>

*Forest extent is as at the first quarter of 2005 and tenure is as at 30 June 2006*

*(a) Nature Conservation Act, Crown Lands Act, and Forest Reserves*

*(b) Includes Multiple-Use Forest*

*(c) Working plantations in Hollybank, Oldina and Dalgarth Forest Reserves used for educational and recreational purposes.*

## **INDICATOR 1.1.b AREA OF FOREST BY GROWTH STAGE**

The spread of age classes across forest communities is a measure of ecosystem diversity, since the structure and species composition of forest change as it grows older. Sustainable forest management requires the maintenance of a full range of age-classes across the forest estate.

This indicator is intended to reflect the general distribution of the growth stages of the different forest communities across broad land-management categories.

Mature forest as reported in this indicator is a different concept from what has been defined as old growth forest under the RFA. Old growth forest is defined as having been subject to negligible unnatural disturbance and being in the late mature to over-mature growth stages. The specific reservation status of old growth forest for conservation purposes is reported under Indicator 1.1.e.

The overall extent of each forest community as at 2005 was updated by applying satellite-detected changes to the 1996 and 2001 RFA mapping, as described under Indicator 1.1.a above. However, this community mapping does not reflect changes in the growth stages of the forest, and must therefore be combined with forest structure mapping to address this indicator.

The age of a natural forest can be difficult to define, because some of the trees may be older than others, understorey species may have colonised well after canopy trees, and precise tree ages are expensive to measure. However, for the purposes of broad-scale categorisation, the crown characteristics (or “growth stage”) of trees are a reliable surrogate for age-class, particularly for eucalypt species. Growth-stage cannot readily be mapped for most non-eucalypt communities. In Tasmania, forest-type mapping by photo interpretation is routinely used to classify growth stages in eucalypt forests: young regeneration, regrowth (typically aged 20 - 100 years), and mature (including over-mature or senescent). Statewide mapping of all tenures was completed in 1996. State forest is now progressively remapped on a rolling 20-year cycle.

Changes in forest structure and type are also updated from ground surveys of harvesting, regeneration, and other forestry operations. Forestry Tasmania maps annual changes in native forests and plantations on State forest. Private Forests Tasmania maps some information on logging, regeneration, and plantation operations supplied by the large industrial companies, and also records farm-forestry plantation activity on private land.

As there is no longer a current program of growth stage remapping over all private property and conservation reserves, the full effects on forest structure of recent logging, fire, and other natural processes in these tenures are not reflected in the data.

Because the growth-stage mapping and the forest-community mapping are compiled independently, reflecting different definitions and attributes of forests, there are some

areas mapped as eucalypt communities for which no growth-stage could be determined from the structural mapping.

The results as at the first quarter of 2005 are summarised in Table 1.1.b below and presented in greater detail in Appendix 1.1 (Tables 1.1.b(i)-(iii)). To reflect the resolution of forest mapping, areas are generally quoted to the nearest 100 hectares; areas smaller than 100 hectares are quoted to the nearest 10 hectares.

The most notable matters evident from the data are:

- The practical limitations of growth-stage mapping continue to limit interpretation of the data. Because there was a high degree of spatial congruence in 1996 between the RFA vegetation mapping and PI-type mapping, few areas were then classified as “Unknown”; greater discrepancies in recent mapping have meant a larger extent of Unknown growth-stage in 2005. Analysis of the non-eucalypt communities is not possible since they are not readily mapped into growth-stages.
- Forest tenure changes, particularly the creation of additional CAR reserves from State forest under the Tasmanian Community Forest Agreement in 2005, have caused the total area of mature forest in conservation reserves to increase at the expense of State forest.
- One outcome of ongoing photo-interpretation (PI) type re-mapping is that the discrepancies between growth stage mapping and forest community mapping increase, causing more forest to be classified as having unknown growth stage. The area remapped for growth stage in the period 1996 to 2001 was significantly greater than the area remapped between 2001 and 2005. Therefore, the impact of this process in the last period has been minimal.
- In consequence of these and other methodological issues, the available data is not sufficiently precise to accurately reflect the small changes in the relative proportions of growth stages over the five-year review period. However, the data does provide a good overview of the 2005 distribution of growth stages by forest type and tenure. The following points illustrate these patterns.
- Of the forest for which growth-stage mapping is available, the majority (74 per cent) is mature.
- Conservation reserve tenures include 20 per cent of the forest mapped as regrowth and 35 per cent of the forest mapped as mature.
- The areas mapped as regeneration are strongly linked to commercially managed communities. However, areas of regeneration are generally only identifiable in State forest, where harvest records can be used to determine stand age. Such data are not available for operations on private land and other tenures.

- In dry eucalypt forests of known growth-stage, the proportion of regeneration and regrowth is relatively low, averaging 19 per cent across all tenures. The proportion of younger forests on State forest, 29 per cent, is substantially higher than for other tenures.
- In the wet eucalypt forests of known growth-stage, the proportion mapped as younger growth-stages (ie. regeneration and regrowth) is 39 per cent which is significantly higher than in the dry eucalypt forests. This is due in part to the ecology of wet eucalypt communities, which tend to grow in single-age stands in which regrowth is readily identifiable. Dry eucalypt forests usually grow in multi-age stands, so that even forests mapped as mature growth-stage usually contain a proportion of younger trees.
- Within the wet eucalypt forests, the highest proportions of younger growth-stages are on private land (56 per cent) and State forest (47 per cent). On conservation reserve tenures, only 17 per cent of these communities are identifiable as younger forests.

**Table 1.1.b Area of native forest types by growth stage and tenure groups (a)**

RFA forest vegetation community by tenure group	Growth Stage (hectares) (e)				TOTAL
	Regeneration	Regrowth	Mature (including overmature)	Unknown	
<b>Conservation reserves (b)</b>					
Dry eucalypt forests	400	54,800	369,300	8,300	432,800
Wet eucalypt forests	300	38,600	188,800	1,500	229,100
Sub-alpine eucalypt forests	0	9,300	34,000	3,300	46,600
Non-eucalypt forests (d)	0	0	0	412,500	412,500
<b>TOTAL</b>	<b>700</b>	<b>102,700</b>	<b>592,000</b>	<b>425,600</b>	<b>1,121,000</b>
<b>Other State forest (c)</b>					
Dry eucalypt forests	26,000	70,500	239,600	9,400	345,500
Wet eucalypt forests	42,700	170,200	240,400	8,200	461,500
Sub-alpine eucalypt forests	100	2,200	5,400	600	8,300
Non-eucalypt forests (d)	0	0	0	210,200	210,200
<b>TOTAL</b>	<b>68,800</b>	<b>242,900</b>	<b>485,400</b>	<b>228,500</b>	<b>1,025,500</b>
<b>Other publicly managed land</b>					
Dry eucalypt forests	600	7,700	44,200	2,900	55,300
Wet eucalypt forests	500	3,200	7,300	200	11,300
Sub-alpine eucalypt forests	0	400	2,300	400	3,100
Non-eucalypt forests (d)	0	0	0	14,900	14,900
<b>TOTAL</b>	<b>1,100</b>	<b>11,300</b>	<b>53,800</b>	<b>18,400</b>	<b>84,600</b>
<b>Private Freehold Land</b>					
Dry eucalypt forests	13,100	109,400	517,900	70,400	710,800
Wet eucalypt forests	4,000	54,100	45,600	15,300	118,900
Sub-alpine eucalypt forests	0	900	4,800	1,200	6,800
Non-eucalypt forests (d)	0	0	0	48,500	48,500
<b>TOTAL</b>	<b>17,100</b>	<b>164,400</b>	<b>568,200</b>	<b>135,300</b>	<b>884,900</b>
<b>TOTAL of all tenures</b>	<b>87,600</b>	<b>521,200</b>	<b>1,699,400</b>	<b>807,800</b>	<b>3,116,000</b>

**Notes:**

- (a) Forest extent is as at the first quarter of 2005 and tenure is as at 30 June 2006
- (b) Nature Conservation Act, Crown Lands Act, and Forest Reserves
- (c) Includes Multiple-Use Forest
- (d) Non-eucalypt communities cannot readily be mapped by growth stage
- (e) Rounded to nearest 10 ha if less than 100 ha, else to nearest hundred hectares. Figures in Total rows are the rounded actual totals.

## INDICATOR 1.1.c EXTENT OF AREA BY FOREST TYPE AND RESERVATION STATUS

The extent of reservation of different forest vegetation communities is a measure of the degree of protection of biological diversity at the species and ecosystem levels.

Under the Tasmanian Regional Forest Agreement (RFA), a comprehensive, adequate and representative (CAR) forest-reserve system was established under a revised land-tenure system to ensure that each forest community is securely protected for conservation purposes. CAR reserves are those reserves designated to meet the above objective of the RFA and can include both formal and informal reserves and occur on both public and private land. Some forest communities are also protected on public land outside the reserve system wherever prudent and feasible. In addition, forest communities identified as rare, vulnerable or endangered (threatened) under the RFA process, are protected from clearance and conversion, on both public and private land, under the Forest Practices System. Under the *Maintenance of a Permanent Native Forest Estate Policy 2005* all of Tasmania's native forests are to be managed so as to maintain at least 95 per cent of their statewide extent as an extensive and permanent native forest estate.

The RFA recognised four components of reservation:

- *Formal reserves*, which are publicly managed land-tenures that cannot be revoked without Parliamentary approval; of these, *dedicated formal reserves* exclude mining;
- *Informal reserves* on public land are protected through administrative instruments by public authorities;
- *Private CAR reserves* are areas of private land that are managed in the long term for the protection of CAR values under secure arrangements, including proclamation under legislation, contractual agreements such as management agreements and covenants, and reserves set aside under independently certified forest management systems; and
- *Values managed by prescription*. These areas outside of other reserves are not recorded as reserves for the purposes of this indicator.

Indicators 1.1.a and 1.1.b provide details on how changes in forest extent are mapped over time. Changes in reservation status are recorded within the Department of Primary Industries and Water's (DPIW) CAR Reserves System database and are recorded as at 30 June 2006. This spatial layer is a composite of public and private reserve data across all land tenures.

Forest extent by the International Union for Nature Conservation (IUCN) categories is summarised in Table 1.1.c.1. The IUCN categories (IUCN, 1994) are as follows:

- Ia - Strict Nature Reserve: Protected Area managed mainly for science.
- Ib - Wilderness Area: Protected Area managed mainly for wilderness protection.

- II - National Park: Protected Area managed mainly for ecosystem conservation and recreation.
- III - Natural Monument: Protected Area managed for conservation of specific natural features.
- IV - Habitat/Species Management Area: Protected Area managed mainly for conservation through management intervention.
- V- Protected Landscape/Seascape: Protected Areas managed mainly for landscape/seascape conservation and recreation.
- VI - Managed Resource Protected Areas: Protected Area managed mainly for the sustainable use of natural ecosystems.

The reservation status of forests whose extent was mapped as at the first quarter of 2005 are summarised in Tables 1.1.c.2 and 1.1.c.3 below and presented in more detail in Appendix 1.1 (Tables 1.1.c(i)-(v)). To reflect the resolution of forest mapping, areas are generally quoted to the nearest 1,000 hectares; areas smaller than 1,000 hectares are quoted to the nearest 100 hectares and areas smaller than 100 hectares are quoted to the nearest 10 hectares. Appendix 1.1 (Table 1.1.c(iv)) also reports the area of communities in each IBRA 4 biogeographic region (Thackway and Creswell, 1995) to reflect their spatial distribution in Tasmania.

The CAR reserve system comprises 3.03 million hectares of land, which is 44.3 per cent of the total land area of Tasmania. Public land reserves comprise 2.955 million hectares and private land reserves 75 000 hectares.

The main changes in the area of CAR reserves since 2002 are the result of:

- i) increased uptake of voluntary conservation of forest on private land through programs such as the Private Forest Reserves Program;
- ii) new formal and informal reserves arising from the Tasmanian Community Forest Agreement signed in May 2005;
- iii) incremental increases in informal reservation on public land, primarily through forest management planning processes on State forest; and
- iv) the inclusion of private reserves set aside under independently certified forest management systems.

The main trends evident from the data are:

- Implementation of the comprehensive, adequate and representative (CAR) reservation framework agreed under the RFA has resulted in an extended system of public and private terrestrial CAR reserves. Within this framework, 1,465,000 hectares of forested land, or 47.0 per cent, of Tasmania's native forests, are now protected, up from the 1996 extent of 977,900 hectares or 30.5 per cent. This represents an increase of 487,100 hectares, or 48.8 per cent of the 1996 area, and by 194,000 hectares, or 15.3 per cent, since 2001.

- As well as the major changes in public land tenure, progress has been made in implementing protected areas on private freehold land. Under these mechanisms, 48,000 hectares of forest have been protected.
- Most protected forests are on public land: 76 per cent of these are in Formal Reserves, of which 43 per cent is unavailable for mining and 33 per cent is subject to the *Mineral Resources Development Act 1995*. Informal reserves and private CAR reserves account for the remaining 24 per cent of reserved native forests.
- More than 25 per cent of the current areas of 42 native forest communities, including all subalpine eucalypt and non-eucalypt communities, are now in reserves.
- Three forest communities have less than 15 per cent of their current extent in reserves: all of which are dry eucalypt communities. For all these communities, the majority of the remaining extent is on unreserved private land.
- Of the 50 native forest communities, 35 have at least 15 per cent of their estimated pre-1750 extent protected in reserves. All sub-alpine eucalypt, all but one non-eucalypt, and most wet eucalypt communities exceed this level of reservation.
- Seven communities, mainly from the dry eucalypt group, have less than 7.5 per cent of their estimated pre-1750 extent protected in reserves. For most of these communities, the remaining extent is primarily on unreserved private land.

**Table 1.1.c.1 Area of native forest type protected by IUCN category of reserve (a)**

RFA Forest Vegetation Community Grouping	IUCN Category							Not Classified (b)	TOTAL
	Ia	II	II/lb	III	IV	V	VI		
<b>Dry eucalypt forests</b>	12,000	73,000	122,000	10,000	20,000	13,000	131,000	181,000	<b>563,000</b>
<b>Wet eucalypt forests</b>	1,000	23,000	118,000	2,000	2,000	9,000	40,000	123,000	<b>318,000</b>
<b>Sub-alpine eucalypt forests</b>	0	4,000	26,000	0	0	5,000	11,000	5,000	<b>51,000</b>
<b>Non-eucalypt forests</b>	500	11,000	22,000	800	1,000	18,000	111,000	165,000	<b>533,000</b>
<b>TOTAL</b>	<b>14,000</b>	<b>11,000</b>	<b>492,000</b>	<b>12,000</b>	<b>23,000</b>	<b>46,000</b>	<b>292,000</b>	<b>474,000</b>	<b>1,465,000</b>

(a) Forest extent is as at the first quarter of 2005 and IUCN category is as at 30 June 2006

(b) The areas listed having a "Not Classified" IUCN category are other reserves within the CAR Reserve system

**Table 1.1.c.2 Area of native forest type protected by reserve class (a)**

RFA Forest Vegetation Community Grouping	Reserve Type						TOTAL
	Public Land			Private Land			
	Dedicated Formal Reserve	Other Formal Reserve (b)	Informal CAR reserve	Other public land (c)	Private CAR reserves	Other private land	
<b>Dry eucalypt forests</b>	223,000	205,000	103,000	302,000	31,000	679,000	<b>1,544,000</b>
<b>Wet eucalypt forests</b>	144,000	84,000	82,000	392,000	8,000	111,000	<b>821,000</b>
<b>Sub-alpine eucalypt forests</b>	30,000	16,000	5,000	7,000	90	7,000	<b>65,000</b>
<b>Non-eucalypt forests</b>	239,000	173,000	113,000	113,000	8,000	40,000	<b>686,000</b>
<b>TOTAL</b>	<b>635,000</b>	<b>479,000</b>	<b>303,000</b>	<b>814,000</b>	<b>48,000</b>	<b>838,000</b>	<b>3,116,000</b>

(a) Forest extent is as at the first quarter of 2005 and reserve class is as at 30 June 2006

(b) Subject to the Mineral Resources Development Act 1995

(c) Includes multiple use State forest

**Table 1.1.c.3 Change in reservation status of native forest types**

RFA Forest Vegetation Community Grouping	Total Area	Total Area in CAR Reserves	Proportion of existing forest now in Reserves	Percentage change since 1996	Proportion of pre-1750 forest extent now in Reserves	Percentage change since 1996
<b>Dry eucalypt forests</b>	1,544,000	563,000	36.5%	+15.0	21.0%	+8.4
<b>Wet eucalypt forests</b>	821,000	318,000	38.7%	+12.4	25.2%	+7.1
<b>Sub-alpine eucalypt forests</b>	65,000	51,000	78.7%	+7.3	73.1%	+7.2
<b>Non-eucalypt forests</b>	686,000	533,000	77.7%	+25.5	66.0%	+20.8
<b>TOTAL</b>	<b>3,116,000</b>	<b>1,465,000</b>	<b>47.0%</b>	<b>+16.5</b>	<b>30.4%</b>	<b>+10.1</b>

## References

Thackway, R. and Cresswell, I.D. (Eds) 1995. *An Interim Biogeographic Regionalisation of Australia for Australia: a framework for establishing the national system of reserves*. Version 4.0 Australian Nature Conservation Agency: Canberra

IUCN - The International Union for the Conservation of Nature and Natural Resources (the World Conservation Union) 1994. *Guidelines for protected area management categories*. Commission on National Parks and Protected Areas with the assistance of the World Conservation Monitoring Centre. IUCN, Gland, Switzerland.

## **INDICATOR 1.1.d FRAGMENTATION OF FOREST COVER**

This indicator is concerned with the size, shape and connectivity of forest. It is also concerned with size of forest remnants and their susceptibility to exotic species invasions; correlation between size of remnants and numbers of species and population viability; and possible impacts on pollination, seed dispersal, wildlife migration and breeding.

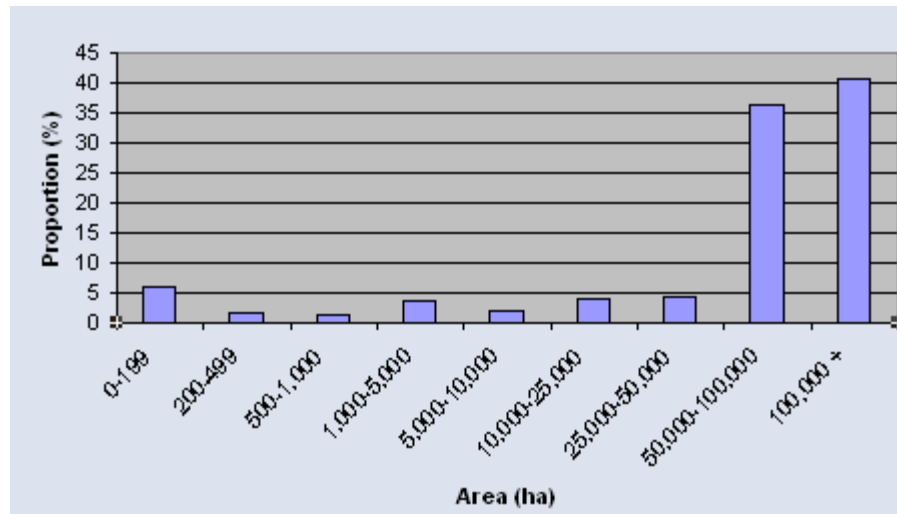
This is a new indicator and forest fragmentation was not specifically considered during the studies leading to the RFA. Consequently there is very limited information concerning many of those attributes described in the above paragraph that are reported on nationally and internationally.

The information presented is from the TASVEG map layer (Version 1.0), which shows forest and woodland occurrences down to patches of about one hectare. This mapping provides a good record of forest patchiness but careful interpretation is required.

All patches of forest and woodland on the TASVEG map were allocated to patch sizes consistent with those used in Australia's State of the Forests Report 2003. The proportion of the total area of forest was calculated for all of the patches in each of the patch size classes and the results presented in a histogram (Figure 1.1.d (i)). If a large area of forest was bisected by a road or a river, it was counted as two patches.

The graph shows that over 76 per cent of Tasmania's forests occur in patches larger than 50,000 hectares. A further eight per cent of total forest area occurs in patches between 5,000 hectares and 50,000 hectares. The remainder is distributed right across the range of remaining size classes below this. About 6 per cent of Tasmania's total forest area occurs in patches less than 200 hectares in size. Over 40,000 patches occurred in the smallest class and only five patches occurred in the classes above 50,000 hectares.

**Figure 1.1.d (i) Proportion of total area of Tasmanian forest, by patch size**



This is a baseline report and trends will not become evident until there are at least two successive time series measures after this baseline.

Forests may be naturally fragmented where they occur in a matrix of non-forest communities, as is the case in vast tracts of the Tasmanian Wilderness World Heritage Area. Many of these smaller forest patches are likely to be forest copses occurring naturally amongst native non-forest vegetation such as in south-west Tasmania. In parts of this area, where fire intervals have been very long, there may also be a process of coalescing forest patches.

In some areas of the dry Midlands, open grasslands have persisted since European settlement. Afforestation of some of these grasslands will not necessarily have positive biodiversity outcomes.

Over 70 per cent of Tasmania has native vegetation cover and there is a high degree of connectivity across the landscape. There is a higher proportion of forest in larger patches in Tasmania (more than 76 per cent) when compared with the national picture (50 per cent).

## INDICATOR 1.1.e AREA OF OLD GROWTH BY FOREST TYPE BY RESERVATION STATUS

The spread of age classes across forest communities is a measure of ecosystem diversity, since the age structure and species composition of a forest change as it grows older. Sustainable forest management requires the maintenance of a full range of age-classes across the forest estate.

The concept of “old growth” is used as a measure of structural diversity; it is defined as ecologically mature forest where the effects of disturbances are now negligible. During the development of the Tasmanian Regional Forest Agreement (RFA) in 1996, old growth was mapped by classifying forests according to the proportion of senescent crowns in each stand and their history of disturbance by fire, harvesting and grazing.

There has been no re-mapping of old growth forest since 1996. In the 2002 Sustainability Indicators Report, the area of old growth forest in 2001 was reported as the 1996 area less the area that had been recorded as logged since 1996. No account was made of recruitment old growth forest from senescing of mature, negligibly disturbed forest.

The Tasmanian Community Forest Agreement (TCFA) in 2005 required the “protection of old-growth forest in Tasmania increased to more than one million hectares with an additional 120,000 hectares of old-growth reservation on public land and the expected voluntary addition of at least 25,000 hectares of old-growth forest on private land through the new Forest Conservation Fund (FCF)”.

For this report the area of old growth forest as at the first quarter of 2005, was determined by updating the RFA old growth mapping by reducing the mapped extent of old growth stands to reflect the change mapping described in Indicator 1.1.a including recent known harvesting and clearing operations. The Department of Primary Industries and Water (DPIW) has mapped changes to forest vegetation type and extent as at early 2005, Forestry Tasmania maps annual changes on public land, and Private Forests Tasmania maps information supplied by the large industrial companies and records of farm-forestry activity on private land.

The RFA recognised four components of reservation:

- *Formal reserves*, which are publicly managed land-tenures that cannot be revoked without Parliamentary approval; of these, *dedicated formal reserves* exclude mining;
- *Informal reserves* on public land are protected through administrative instruments by public authorities;
- *Private CAR reserves* are areas of private land that are managed in the long term for the protection of CAR values under secure arrangements, including proclamation under legislation, contractual agreements such as management

- agreements and covenants, and reserves set aside under independently certified forest management systems; and
- *Values managed by prescription.* These areas outside of other reserves are not recorded as reserves for the purposes of this indicator.

Reservation status is recorded as at 30 June 2006 and is based on DPIW's CAR Reserve System dataset. This spatial layer is a composite of public and private reserve data across all land tenures.

The results as at the first quarter of 2005 are summarised in Tables 1.1.e (i), 1.1.e (ii) and 1.1.e (iii) below and presented in more detail in Appendix 1.1.e (Tables 1.1.e(i)-(iii)). To reflect the resolution of forest mapping, areas are generally quoted to the nearest 1,000 hectares; areas smaller than 1,000 hectares are quoted to the nearest 100 hectares and areas smaller than 100 hectares are quoted to the nearest 10 hectares.

The main trends evident from the data are:

- Within the comprehensive, adequate and representative (CAR) reservation framework agreed under the RFA and the TCFA this framework, 973,000 hectares of old growth forest, or 79.2 per cent of Tasmania's old growth forests, are now in reserves, up from the 1996 extent of 681,900 hectares or 55 per cent. This represents an increase of 291,100 hectares, or 42.7 per cent of the 1996 area and an increase of 122,200 hectares (mainly on public land), or 14.4 per cent of the 2001 area. The main cause for the increase in reserved area of oldgrowth has been the Tasmanian Community Forest Agreement (TCFA), signed in May 2005. The TCFA includes commitments to reserve further oldgrowth forest on both private and public land. The public land component of this reservation is almost complete, with the process for reservation of several thousand hectares of additional public land expected to be finalised in 2007. The approach to reservation of oldgrowth forest on private land agreed to under the TCFA involved establishment of the Forest Conservation Fund, which became operational in 2006. The Forest Conservation Fund involves a tender process being carried out during 2007 to achieve voluntary reservation of oldgrowth forest on private land. There is expected to be a voluntary addition of at least 25,000 hectares of oldgrowth forest through this mechanism. These additions to the reserve system will bring the total oldgrowth extent in reserves to over the TCFA target of one million hectares.
- Of the 42 forest communities in which old growth was mapped for the RFA, 32 have at least 60 per cent of their extent of old growth reserved. With only a few exceptions, wet eucalypt, sub-alpine eucalypt, and non-eucalypt communities have high levels of old growth reservation.
- Four forest communities have less than 30 per cent of their extent of old growth in reserves, all of which are dry eucalypt forest communities. For all four communities, most of the remaining old growth is on unreserved private property.

- As well as the major changes in public land tenure, progress has been made in implementing protected areas on private freehold land. At 30 June 2006, 9,000 hectares of old growth forest had been protected under these mechanisms.
- Of the old growth forest in Tasmania that was mapped in 1996, 17,300 hectares or 1.4 per cent has been harvested over the nine years to June 2005. Most of the loss was in the wet eucalypt group of communities, which decreased by 10,600 hectares, or 4.2 per cent.
- The native forest old growth communities in which the biggest area decreases were recorded over the nine years were tall *Eucalyptus delegatensis* and tall *E. obliqua*. Smaller losses were recorded in *E. regnans*; Callidendrous and thamnic rainforest; dry *E. delegatensis*, dry *E. obliqua* forest and *E. pulchella/globulus/viminalis* grassy shrubby forest.
- Old growth in sixteen native forest communities decreased in area by more than one per cent since 2001: nine of these are dry eucalypt forests, five are wet eucalypt forests, and two are non-eucalypt forest communities.

**Table 1.1.e (i) Old Growth by forest type and tenure (a)**

RFA Forest Vegetation Community Grouping	Land Classification (Tenure)				TOTAL (ha)	Area change since 1996
	Conservation reserves (ha) (b)	Other State forest (ha) (c)	Other publicly managed land (ha)	Private freehold land (ha)		
<b>Dry eucalypt forests</b>	230,000	78,000	17,000	91,000	<b>416,000</b>	-1.2%
<b>Wet eucalypt forests</b>	139,000	91,000	4,000	7,000	<b>241,000</b>	-4.2%
<b>Sub-alpine eucalypt forests</b>	33,000	4,000	1,000	2,000	<b>40,000</b>	-0.1%
<b>Non-eucalypt forests</b>	376,000	134,000	10,000	10,000	<b>531,000</b>	-0.4%
<b>TOTAL</b>	<b>778,000</b>	<b>308,000</b>	<b>32,000</b>	<b>110,000</b>	<b>1,229,000</b>	<b>-1.4%</b>

(a) Forest extent is as at the first quarter of 2005 and tenure is as at 30 June 2006

(b) Nature Conservation Act, Crown Lands Act, and Forest Reserves

(c) Multiple-use forest

Table 1.1.e(ii) Old Growth by forest type and reserve type (a)

RFA Forest Vegetation Community Grouping	Reserve Type					
	Public Land				Private Land	
	Dedicated Formal Reserve	Other Formal Reserve <sup>(b)</sup>	Informal CAR Reserve	Other Public Land	Private CAR Reserves	Other Private Land
Dry eucalypt forests	134,000	95,000	56,000	40,000	6,000	85,000
Wet eucalypt forests	99,000	40,000	33,000	62,000	900	6,000
Sub-alpine eucalypt forests	23,000	10,000	3,000	3,000	20	2,000
Non-eucalypt forests	229,000	146,000	96,000	49,000	2,000	8,000
<b>TOTAL</b>	<b>484,000</b>	<b>292,000</b>	<b>187,000</b>	<b>155,000</b>	<b>9,000</b>	<b>101,000</b>

(a) Forest extent is as at the first quarter of 2005 and reserve type is as at 30 June 2006

(b) Subject to the Mineral Resources Development Act 1995

Table 1.1.e (iii) Change in reservation status of old growth by forests type

RFA Forest Vegetation Community Grouping	Total Area	Total area in CAR Reserves	Proportion of existing old growth forest now in reserves	Change since 1996
Dry eucalypt forests	416,000	291,000	<b>70.0%</b>	+25.7%
Wet eucalypt forests	241,000	173,000	<b>71.6%</b>	+19.9%
Sub-alpine eucalypt forests	40,000	35,000	<b>88.3%</b>	+8.0%
Non-eucalypt forests	531,000	474,000	<b>89.2%</b>	+26.6%
<b>TOTAL</b>	<b>1,229,000</b>	<b>973,000</b>	<b>79.2%</b>	<b>+24.5%</b>

## 1.2 Species Diversity

This sub-criterion monitors the knowledge base for forest-dwelling species, the status of these species and the population levels of a range of representative species across a range of habitats at scales relevant to forest management. The focus of reporting is on vertebrates and vascular plants except where species are listed as rare, vulnerable, endangered or extinct.

### **INDICATOR 1.2.a FOREST- DWELLING SPECIES FOR WHICH ECOLOGICAL INFORMATION IS AVAILABLE**

This indicator will, over time, show improvements in knowledge and the capacity to manage the forest-dwelling species in Tasmanian forests. The intent of this indicator is to ensure that over time forest managers have sufficient knowledge to ensure that additional species do not reach low population levels and require listing under threatened species legislation.

Vertebrate species and vascular plants were chosen as the indicator species because they comprise a conspicuous and often physically dominant component of forest ecosystems. Recent research that includes examples from Tasmanian forests, has demonstrated that overall biodiversity levels are closely linked to the genetic diversity of dominant species in forests (Whitham 2006). This is because of the reliance of other species in the ecosystem on microhabitats created by dominants as well as breakdown products on which other species depend. In addition, a lack of information on invertebrates and lower plants makes their current use as indicator species problematic and of limited practical use for adaptive management.

A list of forest dwelling vertebrate fauna species is provided in Table 1 of Appendix 1.2.a. Species are classified therein according to class (e.g. fish, amphibian, and reptile) and those species whose recovery was implemented between 2001 and 2006 are also noted. This list was derived from Tasmanian Government's Natural Values Atlas (NVA), a web-based atlas for flora and fauna records maintained by the Department of Primary Industries and Water (DPIW). The previous version, known as "GT Spot" was replaced in 2006. New location records are added to NVA with regular updates from incidental observations by DPIW staff and others, and with data provided by the Forest Practices Authority and Forestry Tasmania. Details of forest dwelling vertebrates are summarised in Table 1.2.a.1 below.

Table 2 of Appendix 1.2.a lists currently known forest-dwelling plant species. Taxonomic revisions and new information have resulted in additions to, and deletions from, the previous list of forest-dwelling species. There are 1,017 vascular plant taxa (including subspecies and varieties) that are considered to be forest dwelling and

indigenous to Tasmania. This accounts for 53 per cent of the known indigenous Tasmanian vascular plant taxa. These species are summarised in Table 1.2.a.1 below.

**Table 1.2.a.1 Numbers of forest dwelling taxa within each group**

<b>Group</b>	<b>Number of taxa</b>
<b>Vertebrate fauna</b>	
<b>Total 137</b>	
Fish	11
Amphibians	9
Reptiles	15
Mammals	33
<b>Vascular Plants</b>	
<b>Total 1017</b>	
Dicotyledons	659
Monocotyledons	261
Pteridophytes	86
Gymnosperms	11

Table 1.2.a.2 summarises additions to and deletions from the list of forest dwelling species since 2001 for vascular plant taxa listed on the *Threatened Species Protection Act* 1995. The changes are based on new information gathered largely during compilation of information on species for the preparation of the Threatened Flora of Tasmania (Threatened Species Unit 2003), consisting of Note Sheets or Listing Statements for all listed plant taxa in Tasmania. The Threatened Flora of Tasmania is available on CD and on the DPIW website. The DPIW has collated data relevant to the conservation status of species in the Natural Values Atlas database (replacing GT Spot). A significant source of the data has arisen from data provision requirements for permits that have been issued for the taking of threatened flora for identification purposes and lodgement of specimens at the Tasmanian Herbarium.

**Table 1.2.a.2 Changes to the list of forest dwelling vascular plant taxa**

<b>Type of change</b>	<b>Reason for proposed change</b>	<b>No. of species added or removed since 2001</b>
Additions to the TSPA list of flora species (including newly listed species)	New information available	+ 42 (11)
Removal of listed species (including delisted species deemed to be invalid or non-native taxa)*	New information available	- 32 (5)

\**Brachyscome tenuiscapa* var. *pubescens*, *Chamaesyce drummondii*, *Epacris* aff. *exserta* 'Union Bridge', *Goodenia amplexans*, *Isolepis setacea*.

Between 2001-02 (as listed in the 2002 Sustainability Indicators Report) and 2006, no new forest-dwelling vertebrate fauna species, were identified. No forest dwelling species is believed to have become extinct in this period.

Table 1.2.a.3 summarises information known for vascular plants and different categories of vertebrates. Even for those groups where a relatively larger amount of information is available, there are still many species for which little is known.

**Table 1.2.a.3 Number of native forest associated species and level of information regarding those species available for management decisions**

Taxa	Number of native forest associated species	The level of habitat, disturbance and life history information available on which management decisions are based*		
		None (no information is available to inform management decisions)	Partial (some information is available but some crucial information absent)	Comprehensive (adequate to make management decisions)
Fish	11	0%	64%	36%
Amphibians	9	19%	63%	18%
Reptiles	15	38%	38%	24%
Birds	69	38%	23%	39%
Mammals	33	32%	35%	33%
Vascular Plants	1017	10%	80%	10%

\* The percentage estimates are based on expert opinion of scientific officers from Inland Fisheries Service, Forest Practices Authority and Department of Primary Industries and Water

## References

Whitham, T.G., Bailey, J.K., Schweitzer, J.A., Shuster, S.M., Bangert, R.K., LeRoy, C.J., Lonsdorf, E., Allan, G.J., DiFazio, S.P., Potts, B.M., Fischer, D.G., Gehring, C.A., Lindroth, R.L., Marks, J., Har, S.C., Wooley, S.C. and Wimp, G.M. (2006). Community and ecosystem genetics: a framework for integrating from genes to ecosystems. *Nature Reviews Genetics* 7:510-523

## **INDICATOR 1.2.b THE STATUS OF FOREST-DWELLING SPECIES AT RISK OF NOT MAINTAINING VIABLE BREEDING POPULATIONS, AS DETERMINED BY LEGISLATION OR SCIENTIFIC ASSESSMENT**

This indicator is a measure of management effectiveness. Changes to the status of threatened or priority species may indicate whether protection and management measures are improving, maintaining or worsening the conservation status of given species. Some species may change listing status as new information is available. Up-listing or down-listing may be independent of the protection or management effort towards a species.

The tables in Appendix 1.2.b.1 document the 2002 baseline list of RFA Priority Species and recommended additions and deletions with reasons for changes. This baseline list was a result of the Scientific Advisory Committee's (SAC) review in 2000 of the Tasmanian *Threatened Species Protection Act 1995* (TSP Act). The recommended changes to the RFA Priority Species List identified in these tables are those proposed by the Department of Primary Industries and Water (DPIW) and have been forwarded to the SAC for endorsement.

RFA Priority Species comprise forest-associated species that meet any of the following criteria:

1. Listed under the Schedules of the Tasmanian *Threatened Species Protection Act 1995*;
2. Listed as Extinct, Extinct in the Wild, Critically Endangered, Endangered or Vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*;
3. Identified as requiring further research to determine requirement for listing;
4. Is a component of a special species group or habitat surrogate (eg. karst species, hollow dependent fauna) identified under the Forest Practices Code.

Changes to the *Threatened Species Protection Act 1995* (TSP Act) listing status of existing and proposed RFA Priority Species since 2001 are summarised in Table 1.2.b.1 with details provided in Appendix 1.2.b.2.

Changes to the status of existing and proposed RFA-Priority Species listed under the TSP Act over the last five years were based on information provided to the Threatened Species SAC through nominations from the community supplemented by information collated and held by the DPIW. The SAC's criteria for listing are based on International Union for the Conservation of Nature criteria approved by the Director of National Parks and Wildlife.

**Table 1.2.b.1 Summary of changes in listing status of forest dwelling flora and fauna under *Threatened Species Protection Act 1995* since 2001**

	Flora	Fauna
Number of species with changed TSP Act listing status	41	17
Number of species which have moved to a higher category of risk	4	1
Number of species which have moved to a lower category of risk*	3	0
Number of species added to the TSP Act list	26	16
of which lichens comprise	15	
Number of species de-listed	9	0
Number of species rediscovered from extinct status*	3	1

\**Mentha australis* was unlisted in 2001. It was briefly listed as extinct in 2003 before being downlisted in 2005

Changes to conservation status of plant and animal species listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) that are on the existing or proposed RFA Priority Species list are given in Table 1.2.b.2.

**Table 1.2.b.2 Changes to the EPBC Act status of RFA-Priority Species**

Species	Change	Reason
<b>Flora</b>		
<i>Epacris limbata</i>	Up list from Vulnerable to Critically Endangered	new information
<i>Allocasuarina duncanii</i>	Delist from Vulnerable	survey
<i>Eucalyptus gunnii</i> subsp. <i>divaricata</i>	List as Endangered	new endemic species
<i>Epacris</i> sp. aff. <i>virgata</i> 'graniticola'	List as Endangered	data collation
<i>Ozothamnus reflexifolius</i>	List as Vulnerable	new endemic species
<i>Boronia gunnii</i>	List as Vulnerable	new endemic species
<i>Boronia hemichiton</i>	List as Vulnerable	new endemic species
<i>Boronia hippopala</i>	List as Vulnerable	new endemic species
<i>Bertya tasmanica</i> subsp. <i>tasmanica</i>	List as Endangered	new endemic species
<i>Epacris acuminata</i>	Down list from Endangered to Vulnerable	survey
<b>Fauna</b>		
<i>Acanthiza pusilla archibaldi</i>	List as Endangered	review of conservation status
<i>Acanthornis magnus greenianus</i>	List as Endangered	review of conservation status
<i>Engaeus granulatus</i>	List as Endangered	new information
<i>Engaeus martigener</i>	List as Vulnerable	new information
<i>Neophema chrysogaster</i>	Up list from Endangered to Critically Endangered	review of conservation status
<i>Sarcophilus harrisii</i>	List as Vulnerable	new information

Factors prompting a change of status under the TSP and EPBC Acts for existing or proposed RFA-Priority plant species over the last five year reporting period include:

- Nominations for a change in the TSP or EPBC Act listing status increasing awareness of species and frequently prompting further survey or research. This has improved information, often resulting in a further change of status (eg the previously unlisted *Mentha australis* was rediscovered following a nomination to list the species as extinct on the TSP Act).
- Significant declines - eg a previously known informally described taxon within the *Eucalyptus gunnii/archeri* complex has declined dramatically in recent years, prompting formal description as *Eucalyptus gunnii* subsp. *divaricata* (Miena cider gum) and nomination for listing, allowing for a focussed recovery effort. Recovery actions in progress to stem the ongoing decline and to establish *ex situ* holdings will ensure that the species does not become extinct in the wild in the short term.
- Taxonomic review, prompting survey, research and collation of data to allow an assessment of the conservation status of new and revised taxa (eg review of Tasmanian *Boronia* species leading to the listing of *Boronia gunnii*, *Boronia hemichiton* and *Boronia hippopala* on the TSP and EPBC Acts).
- Natural Values Reports, a tool developed in 2002 and now available in the Natural Values Atlas, to allow the easy and rapid identification of natural values in the vicinity of specified locations. The use of these reports has significantly improved the consideration of threatened plants at sites for proposed management, harvesting or development. The reports allow for the planning of targeted survey at appropriate times of the year for the identification of threatened plants with potential to occur at sites. This has resulted in improved knowledge of the distribution of species.
- Research - eg While information on much of the non-vascular flora of Tasmania is lacking, lichens have been well studied by one Tasmanian expert (Kantvilas 2006). Approximately 50 of the approximate 1000 described lichen taxa in Tasmania meet the TSP Act criteria for listing particularly as their habitats are not always represented in Tasmania's reserve system or protected by regulation of threatened vegetation communities or threatened species habitat. There has been a concerted effort, over the last decade to nominate these taxa for listing. There are currently twenty-eight lichens listed on TSP Act, twenty-two of which are considered to be forest dwelling. Fifteen of the forest dwelling lichens have been listed on TSP Act since 2001.

Appendix 1.2.b.1 also includes proposed additions to, and removals from the list of RFA-Priority Species for vascular plant species that are not listed on the TSP or EPBC Acts. The recommendations to add or remove include taxa that:

- result from splits or mergers involving existing or proposed RFA-Priority Species and that require further research to determine their conservation and taxonomic status (11 species);
- are either under consideration for listing or meet the criteria for listing and have nominations proposed (3 species);

- that require further research as they appear to intergrade with existing or proposed RFA-Priority Species and face the same threats eg. *Xanthorrhoea australis*;
- did not meet the criteria for listing on TSP Act when assessed and is therefore recommended for removal eg. *Boronia rhomboidea*.

Examples of RFA-Priority Species of flora that have undergone on ground recovery actions (other than survey and monitoring) in order to reduce extinction risk over the last five year reporting period include *Eucalyptus gunnii* subsp. *divaricata*, *Tetratheca gunnii*, *Conospermum hookeri*, *Eucalyptus morrisbyi*, *Hypolepis distans*, *Epacris virgata*, *Epacris acuminata*, *Phebalium daviesii*, *Euphrasia gibbsiae* subsp. *psilantherea*, *Euphrasia fragosa*, *Euphrasia* aff. *diemenica* and *Hardenbergia violacea*. These actions include fencing/caging, weeding, reduction of competition, slashing or ecological burning to promote recruitment and establishment of *ex situ* holdings. These recovery actions have been largely funded through the Natural Heritage Trust and Natural Resource Management Programs. In addition, the extinction risk to a number of RFA-Priority plant species has also been reduced through inclusion of habitat in reserves and through preparation of conservation covenants and management agreements under the Private Forest Reserves Program and the Private Property Conservation Program incorporating the previous Protected Areas on Private Land Program and the Non-Forest Vegetation Program. These actions may, in the longer-term, result in downlisting of the TSP and EPBC Act status of some species.

A Public Authority Management Agreement (PAMA) between Forestry Tasmania and the DPIW was entered into in 2003 to manage *Eucalyptus radiata* subsp. *robertsonii*. The distribution of this species is largely confined to land managed by Forestry Tasmania.

A number of species have declined further due to increased risk of extinction from ongoing threatening processes that are difficult to address at the species level. These include climate change (eg *Eucalyptus gunnii* subsp. *divaricata* and *Eucalyptus morrisbyi*), spread of *Phytophthora cinnamomi* (eg *Epacris limbata*, *Xanthorrhoea arenaria* and *X. bracteata*) and increased browsing pressure from feral animals (rabbits, deer, pigs and lyrebirds) and from increased browsing pressure from native animals whose numbers have increased as a result of increased food supply associated with agricultural activity.

Research over the last five years has identified *Eucalyptus perriniana* as a species susceptible to contamination from pollen from nearby *Eucalyptus nitens* plantations (Barbour *et al.* 2005, 2006). Plantations near one population commenced flowering in 2004. Research has been initiated to quantify the risk and to provide prescriptions to minimise and manage future risk from *E. nitens* plantations.

### References

- Barbour, R.C., Potts, B.M. and Vaillancourt, R.E. (2005). Gene flow between introduced and native *Eucalyptus* species: crossability of native Tasmanian species with exotic *E. nitens*. *Australian Journal of Botany* 53: 465-477

Barbour, R.C., Potts, B.M., Vaillancourt, R.E. and Tibbits, W. (2006). Gene flow between introduced and native Eucalyptus species: flowering asynchrony as a barrier to F1 hybridisation between exotic *E. nitens* and native Tasmanian *Symphyomyrtus* species. *Forest Ecology and Management* 226: 9-21.

Kantvilas, G. (2006). Tasmania's threatened lichens: species and habitats. In *Proceedings of the 7<sup>th</sup> and 8<sup>th</sup> Symposia on Collection Building and Natural History Studies in Asia and the Pacific Rim*, edited by Y. Tomida *et al.* *National Science Museum Monographs* 34: 149-162.

## **INDICATOR 1.2.c REPRESENTATIVE SPECIES FROM A RANGE OF HABITATS MONITORED AT SCALES RELEVANT TO REGIONAL FOREST MANAGEMENT**

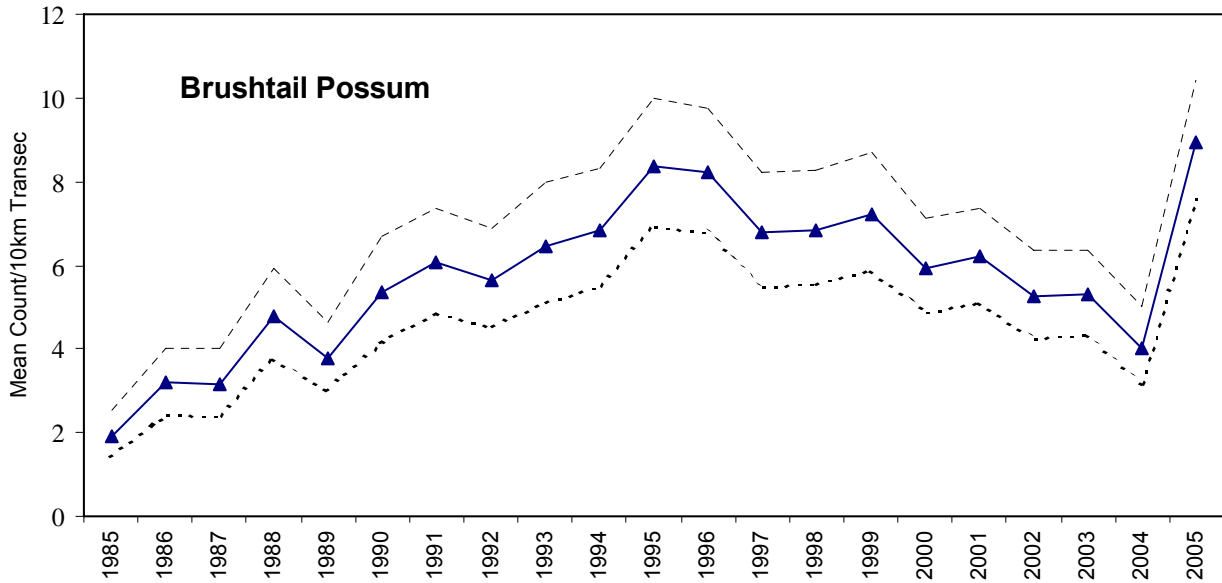
This indicator is a broad measure of the conservation status of a variety of representative species across habitats. This measure reflects elements of ecosystem and genetic diversity and can be quantified using population information or information on population level surrogates such as habitat or range.

For vascular flora, population information is collated with the preparation of Listing Statements under provisions of the *Threatened Species Protection Act 1995*, of which 52 have been prepared for existing or proposed RFA Priority Species of flora (see Appendix 1.2.b). Listing Statements can be updated every five years or as new information becomes available. The preparation of flora Listing Statements will be greatly enhanced by the capacity to hold population data in the Natural Values Atlas database.

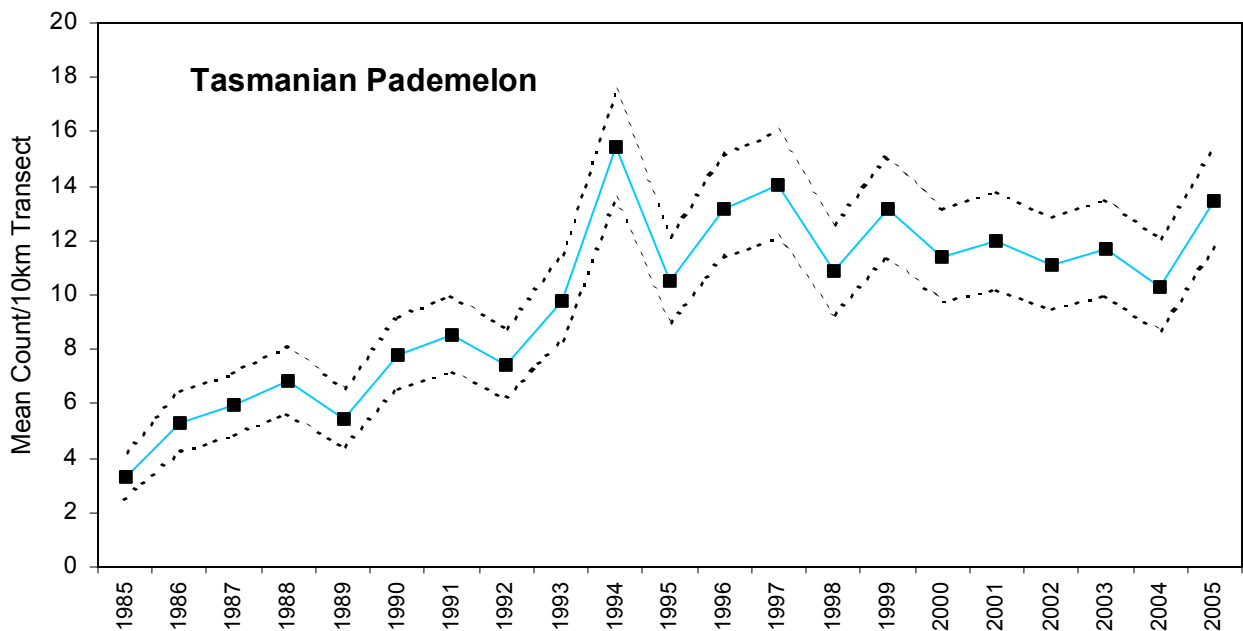
For fauna, long-term monitoring of abundance has been carried out for the brushtail possum, the Tasmanian pademelon, Bennetts wallaby, the Tasmanian devil, the common wombat and the eastern quoll. The graphs in Figures 1.2.c.1-6 below indicate no decline in abundance for five of the six monitored species. The exception is the Tasmanian devil which in recent years has been severely affected by the Devil Facial Tumour Disease (DFTD).

DFTD has now been confirmed in Tasmanian devils across more than half of Tasmania's mainland (Figure 1.2.c.7), and has been demonstrably linked to a 41 per cent decline in the population over the past ten years (Hawkins *et al.* 2006). This cancerous disease (Loh *et al.* 2006) takes the form of tumours on the head of the devil, which may spread to other parts of the body. Death occurs within months of the first signs. It appears to be a new, infectious disease, typically affecting only adults. The cancerous cells are themselves thought to be the agent of infection (Pearse & Swift 2006); no viruses or other disease agents have been identified, despite extensive investigation. While wildlife diseases rarely cause extinction, there is as yet no evidence to suggest that DFTD will not continue to spread across Tasmania, or that populations can recover once infected. To date, Tasmanian devils still exist throughout the mainland of the State, in all rural habitats. No local extinctions have yet been detected. However, an 89 per cent population decline has occurred in the region where DFTD signs were first reported. The first clear indications of the impact and wide distribution of DFTD emerged in 2003. The DFTD program was established in 2004 in response.

**Fig.1.2.c.1 Statewide trends in the abundance of the Tasmanian pademelon, Bennetts wallaby, brushtail possum, common wombat, Tasmanian devil and eastern quoll for the period 1985-2005**  
 Statewide trend lines include 95% confidence limits  
 (Greg Hocking, Department of Primary Industries and Water, pers. comm.)



**Figure 1.2.c.1 Brush-tailed possum – stable (annual spotlight survey data – 1996 -2005)**



**Figure 1.2.c.2 Tasmanian pademelon – stable (annual spotlight survey data – 1996 - 2005).**

### Bennetts Wallaby

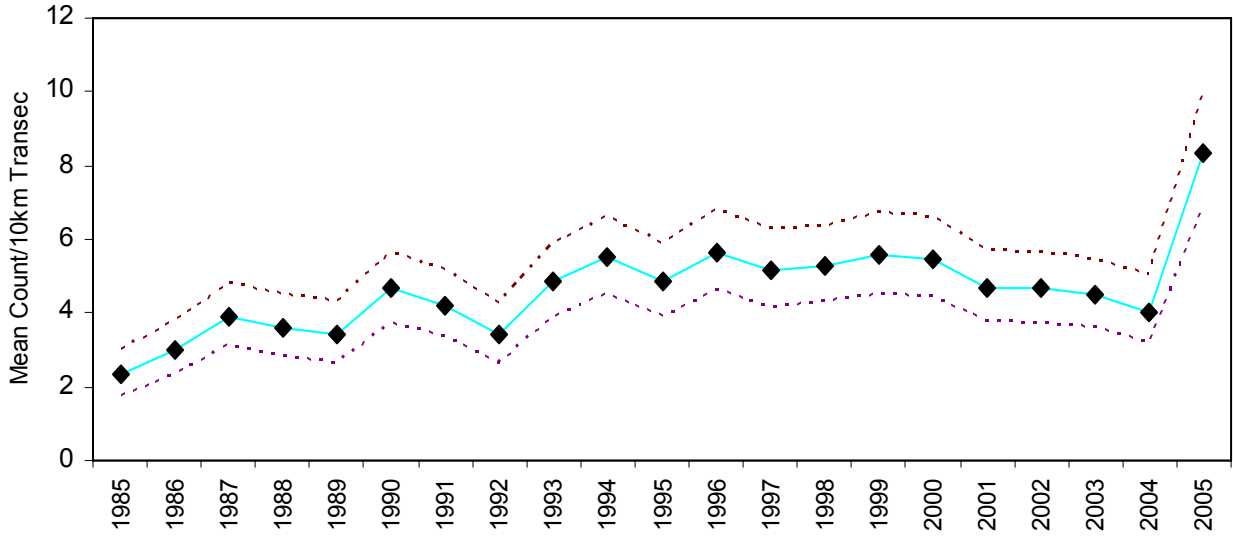


Figure 1.2.c.3 Bennetts wallaby – stable ( annual spotlight survey data 1996 - 2005).

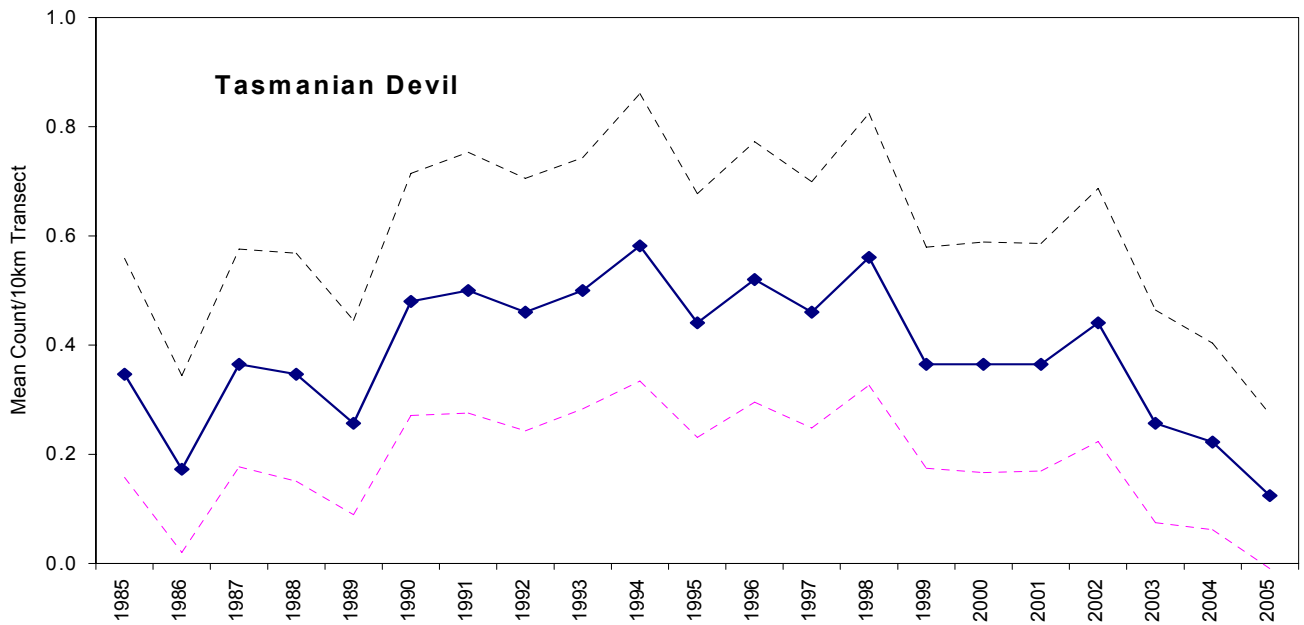


Figure 1.2.c.4 Tasmanian devil – (annual spotlight survey data – 1996 - 2005)

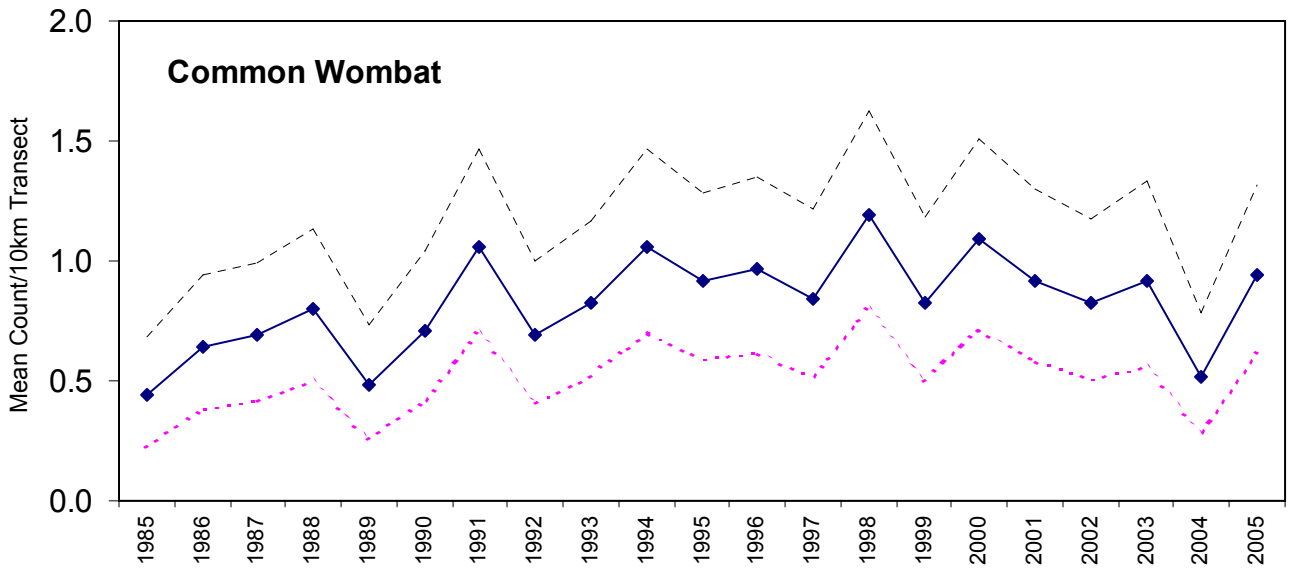


Figure 1.2.c.5 Wombat – (annual spotlight survey data – 1996 - 2005)

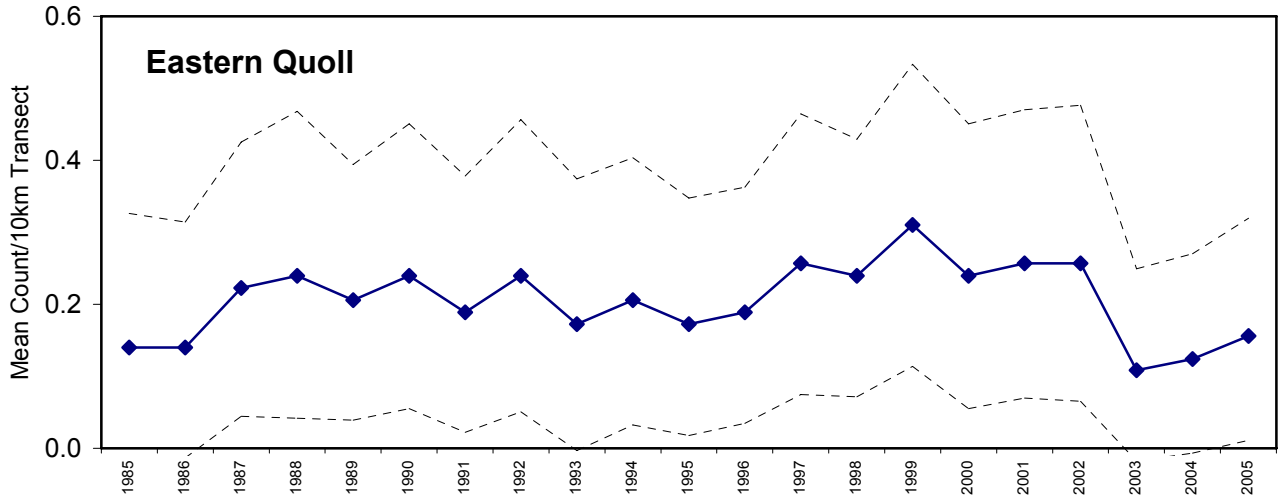
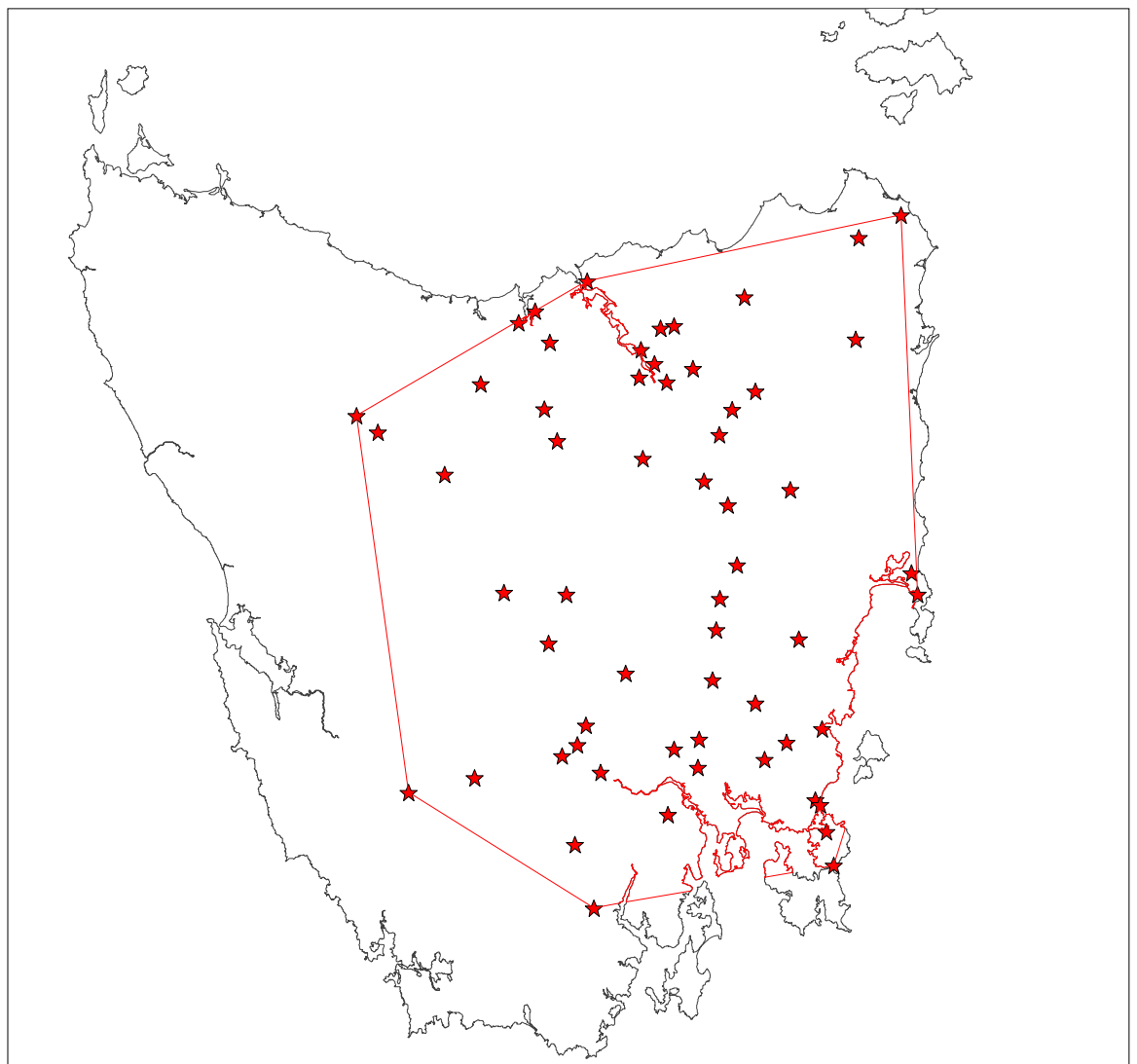


Figure 1.2.c.6 Eastern Quoll – (annual spotlight survey data – 1996 - 2005)

The DFTD program's key focal areas are:

- **Population monitoring** - Gathering data in the field to clarify disease distribution and impacts (Hawkins *et al.* 2006), and using this to help determine conservation strategies.
- **Disease diagnostics** - A laboratory-based investigation of the disease itself, which includes defining the disease (Loh *et al.* 2006) and exploring its transmission and possible causes (Pearse & Swift 2006).
- **Wild management** - Establishing methods for managing the impact of the disease in the wild (McCallum & Jones 2006).
- **Captive management** – Assembling captive breeding populations using devils from disease free areas.



**Figure 1.2.c.7** By November 2006, Devil Facial Tumour Disease was confirmed in Tasmanian devils from 60 different locations across 58 per cent of the mainland.

Population size data are available on four species of bird including wedge-tailed eagle (overall population size and breeding population), swift parrot (population estimates), forty-spotted pardalote (population census) and orange-bellied parrot (population estimate), five species of fish and one species of butterfly, Ptunarra brown butterfly (density estimates over known habitat areas).

Habitat models have been constructed for swift parrot (foraging habitat), forty-spotted pardalote, wedge-tailed eagle (nesting habitat), grey goshawk (nesting habitat), keeled snail, Mt Mangana stag beetle, Simsons stag beetle and Ptunarra brown butterfly.

Population indices have been calculated for possums, wallabies, carnivorous marsupials, platypus, burrowing crayfish (three species), cave fauna, Simsons stag beetle, giant freshwater crayfish. Spotlight surveys are made to estimate abundances of possums, wallabies and carnivorous marsupials across Tasmania. Burrowing crayfish, foliage insects and cave fauna are surveyed to determine population trends in response to forest management at a regional and local level. Selected Ptunarra brown butterfly populations were assessed annually between 1997 and 2002, in 2005 and will be assessed again in 2007.

Surveys and research studies are being carried out by the Department of Primary Industries and Water; the Forest Practices Authority; the University of Tasmania; and Forestry Tasmania. The results from population and ecological studies are used to update and refine management prescriptions that are applied under the Forest Practices Code.

For species about which relevant information has been collected, the following population trends are indicated:

- ***Swift parrot:***

The annual monitoring program (breeding season) for swift parrots has been conducted annually from 1999-2005. The results to date indicate the following: The usefulness of the method is heavily constrained by the variability in blue-gum flowering between years. In years of poor blue-gum flowering (2000 and 2002), very few swift parrots are recorded at very few sites. In years of moderate to heavy blue-gum flowering (1999, 2001, 2003, 2004 and 2005), swift parrots are recorded at around 25-30 per cent of sites. Excluding the poor flowering years 2000 and 2002, the trend in swift parrot population index appears to be reasonably steady. However, these results are inconclusive as they cover a relatively short period (six years span), and the method is influenced by the temporal and spatial variability in blue-gum flowering patterns.

During the 2004-05 and 2005-06 breeding seasons nest site surveys found 134 swift parrot nests. Previous to this dedicated study only 40 nests had been recorded throughout Tasmania. Many of these nests formed breeding aggregations of up to 50 nests covering approximately 100 hectares. The information collected from known nest sites and from additional surveys targeting both nesting and foraging

habitat is being integrated into the management of breeding habitat, and used to identify high potential nesting habitat.

Protection is provided for two of the key habitats in Tasmania for the swift parrot foraging (i.e. grassy *Eucalyptus globulus* forest and shrubby *E. ovata* forest). Protection is provided from clearing and conversion of these habitat types on both public and private land via the Forest Practices System. Prescriptions for management of swift parrot nesting and foraging habitat are currently under review with the view to improving the management of both nesting habitat (particularly as the species tends to exhibit aggregated nesting behaviour), and foraging habitat in wet forest types (particularly near coastal *E. globulus* forest).

**Table 1.2.c.1 Breeding season survey data**

Year	Population estimate		
<b>Population censuses</b>			
1987	2640		
1995	1840		
<b>Standardised monitoring program</b>			
Year	No. of sites surveyed	No. sites Swift parrots recorded	Mean No. Swift parrots per site $\pm$ SE
1999	55	15 (27%)	0.9 $\pm$ 0.3
2000	64	2 (3%)	0.5 $\pm$ 0.4
2001	73	19 (26%)	3.1 $\pm$ 1.2
2002	73	2 (3%)	0.03 $\pm$ 0.02
2003	73	17 (23%)	2.8 $\pm$ 1.3
2004	73	29 (40%)	3.2 $\pm$ 0.9
2005	72	23 (32%)	2.7 $\pm$ 0.8

- **Wedge-tailed eagle:**

Revision of the population estimates was undertaken in 2005 based on the then current knowledge of nest distribution and activity. There are an estimated 458 territories, representing 86 per cent of the pre-settlement number. Former territories have been lost due to habitat modification, urban development and disturbance from human activity. Activity data indicates that only around 50 per cent of territories are occupied by breeding pairs. By extrapolation, from the demography of similar species, the population is between 1200-1500 individuals with approximately half being mature-aged birds.

By extrapolation of the proportion of successful nests to the total known territories, (assuming randomness of disturbance levels), approximately 230 offspring are fledged each breeding season from the 255 active territories. When mortality is taken into account, (as much as 50 per cent in first-year birds), only about 60 of these will survive to breeding age.

Table 1.2.c.2 shows the proportions of nests in four activity categories: not active; reused; successful; and unsuccessful. These data show the consistently high proportion of inactive nests and low rate of nest success. Nests within the reused category may fall into the successful or unsuccessful category, however, they may also have been lined and another nest used for breeding.

**Table 1.2.c.2 Nest activity of Tasmanian wedge-tailed eagles**

Data: proportion (number)

Nests	Breeding season						Total
	2000	2001	2002	2003	2004	2005	
<b>Not active</b>	0.50 (104)	0.48 (61)	0.46 (33)	0.61 (41)	0.53 (49)	0.55 (115)	0.52
<b>Reused</b>	0.17 (36)	0.26 (33)	0.32 (23)	0.34 (23)	0.21 (19)	0.33 (70)	0.26
<b>Successful</b>	0.28 (57)	0.22 (28)	0.21 (15)	0.04 (3)	0.20 (18)	0.10 (21)	0.18
<b>Unsuccessful</b>	0.04 (9)	0.04 (5)	0.01 (1)	0.00	0.07 (6)	0.01 (3)	0.03
<b>N=</b>	<b>206</b>	<b>127</b>	<b>72</b>	<b>67</b>	<b>92</b>	<b>209</b>	<b>773</b>

**Definitions of table terms.**

**Not active**-none of the known nests in a territory was used for a breeding attempt.

**Reused**-At least one nest in the territory was lined or birds were observed incubating eggs or small chicks less than three weeks old but the outcome of the attempt is not known.

**Successful**- A chick older than three weeks of age was observed in a nest or a fledgling seen in the territory (usually with parents) or evidence (whitewash or prey remains and down) from the nest strongly indicates that fledging was successful.

**Unsuccessful**- An attempt at breeding in that territory failed.

The number of nests known has greatly increased in the last few years due to the increased level of reporting of nests, through pre-logging surveys, assessment by the Private Forests Reserves Program and the Department of Primary Industries and Water. Management of nests that are affected by forestry and agricultural activities is improving and there is progressively more effort being directed towards pre-logging searches and reserve management. Under the Forest Practices System, pre-logging searches are required in potential nesting habitat. When a nest is found it is required to be protected in an undisturbed reserve of at least 10 hectares. The average reserve size is increasing, particularly on State forest.

Research into effectiveness of current forest management practices is planned for 2007 by the Forest Practices Authority and the Department of Primary Industries and Water. Management prescriptions are kept under review and improvements ongoing.

- ***Forty-spotted pardalote:***

Population estimates for this species were reported in the 2002 Sustainability Indicators Report. In this report a population estimate of 3840 individuals was recorded, which was a ten percent increase from the estimate made in 1986. This

difference can be attributed to the discovery of an additional 13 colonies, on Flinders Island, Bruny Island, Tinderbox and Howden. At least three colonies have been lost since 1986, one at Lime Bay, one at Coningham and one on Bruny Island. A population census is scheduled for the 2007 breeding season for this species.

- ***Grey goshawk:***

The Forest Practices Authority and the Department of Primary Industries and Water have undertaken a preliminary study of grey goshawks' foraging and habitat requirements. Management prescriptions are currently aimed at protecting nesting habitat in riparian areas and further work is needed to assess the impact of the loss of foraging habitat. A habitat model has been recently developed for this species. This is a GIS based model using existing vegetation layers, known nest localities and expert knowledge. Core habitat is concentrated in the west of the State where important habitat includes wet and mixed forest, blackwood swamps and riparian forest.

- ***Eastern-barred bandicoot:***

The population decline recorded between 1992 and 1996 was thought to be due to drought. No reliable data have been collected since then to determine population trends.

### References

- Brereton, R. 1999. *Swift Parrot Recovery Plan: 1997-2000*. Department of Primary Industries, Water and Environment, Hobart.
- Brown, P.B. 1986. The Forty-spotted Pardalote in Tasmania. *Wildlife Division Technical Report* 86/4. National Parks and Wildlife Service, Tasmania.
- Brown, P.B. 1989. The forty-spotted pardalote on Maria Island. *Tasmanian Bird Report* 18:4-13.
- Brown, P.B. 1989. *The Swift Parrot Lathamus discolor (White): A report on its ecology, distribution and status, including management considerations*. Technical Report, Department of Lands, Parks and Wildlife.
- Bryant, S.L. 1997. Status of colonies of the forty-spotted pardalote. *Tasmanian Bird Report* 26: 45-51
- Hawkins, C.E., Baars, C., Hesterman, H., Hocking, G.J., Jones, M.E., Lazenby, B., Mann, D., Mooney, N., Pemberton, D., Pyecroft, S., Restani, M. and Wiersma, J. 2006. Emerging disease and population decline of an island endemic, the Tasmanian devil *Sarcophilus harrisii*. *Biological Conservation* **131**, 307-324.
- Loh, R., Bergfeld, J., Hayes, D., O'Hara, A., Pyecroft, S., Raidal, S. and Sharpe, R. 2006. The pathology of devil facial tumor disease (DFTD) in Tasmanian devils (*Sarcophilus harrisii*). *Veterinary Pathology* **43**: 890-895.

- McCallum, H. and Jones, M. 2006. To lose both would look like carelessness: Tasmanian devil facial tumour disease. *PLoS Biol* **4**(10): e342. DOI: 10.1371/journal.pbio.0040342
- Pearse, A.M. and Swift, K. 2006. Transmission of devil facial-tumour disease. *Nature* **439**: 549
- Swift Parrot Recovery Team 2001. *Swift Parrot Recovery Plan*. Department of Primary Industries, Water and Environment, Hobart.
- Threatened Species Section 2006. *Fauna Recovery Plan: Forty-Spotted Pardalote 2006-2010*. Department of Primary Industries and Water, Hobart
- Threatened Species Section 2006. *Threatened Tasmanian Eagles Recovery Plan 2006-2010*. Department of Primary Industries and Water, Hobart
- Webb, M. and Voogdt, J. 2006. *Nest site selection of the Swift Parrot*. Internal Technical Report. Department of Primary Industries, Water and Environment, Hobart

## 1.3 GENETIC DIVERSITY

This sub-criterion focuses on two distinct areas. It monitors the loss of genetic variation in forest associated species, the potential impact on species viability and conservation mechanisms that have been implemented.

Secondly, it reports on the development and implementation of genetic resource conservation mechanisms for commercially important native timber species.

### **INDICATOR 1.3.a FOREST-ASSOCIATED SPECIES AT RISK FROM ISOLATION AND THE LOSS OF GENETIC VARIATION, AND CONSERVATION EFFORTS FOR THOSE SPECIES**

Most of Tasmania's species of native flora and fauna will have lost some of their genetic variation in the course of human occupation of the State, and particularly since European settlement. Such loss has mainly resulted from clearing and modification of native vegetation for agriculture, settlement, forestry and other purposes. Other human-induced or natural events (eg wildfire, disease) have also contributed to loss of genetic variation.

The intention of Indicator 1.3.a is to document the level of knowledge about species that now only occupy a small part of their former range, resulting in a greater risk that they may have lost genetic variation. There are considerable difficulties in dealing with this indicator – in part because of lack of detailed information on the past distribution of many of Tasmania's species; and lack of information on genetic variation in past and extant populations. There are also uncertainties about the effects of regulated activities on some species, let alone the impacts less predictable events (such as the spread of the facial tumour disease affecting Tasmanian devil populations).

To provide a benchmark for future reporting, the analysis is focused on forest-associated species that are identified as threatened or otherwise of conservation interest. These species occur on or are proposed for inclusion on the RFA Priority Species list (see Appendix 1.2.a). These species are the focus of the indicator because many of these species have already been identified as “at risk”, and because much of Tasmania's conservation-oriented research and management has been directed towards them. For the purposes of this indicator, the term species refers to the taxa as they are listed. Some of the listed taxa considered for this indicator are listed at the sub-specific level where the species may be of no concern for this indicator, for example *Acacia mucronata* and *Asplenium trichomanes*. In addition, following the approach adopted in reporting on Indicator 1.2.a, the analysis has only considered vertebrate fauna species and vascular plant species (excluding orchids – a family subject to a high degree of taxonomic change which, coupled with the ephemeral nature of most species, makes determination of extant and past distributions particularly difficult).

It should be noted that knowledge of genetic variation in Tasmanian native species, and conservation measures to maintain that variation, is probably greatest in some non-threatened species which are of economic importance – the most outstanding example being the Tasmanian blue gum (*Eucalyptus globulus*) – see discussion under Indicator 1.3.b.

Priority species in the subset described above have been allocated to potential risk categories, on the basis of known or likely loss of habitat and continuing risk of loss of genetic variation. Such risk can be inferred by substantial reduction in range and loss of disjunct populations, but other reasons for loss of genetic variation generally cannot be so readily implied – for example, when species still occur throughout most of their range, but some populations have been reduced substantially in size, or some habitats (eg fertile valley flats) have been preferentially cleared while other habitats in the same area (eg steeper slopes) remain unmodified.

The categories of potential risk are:

- **Potential High Risk:** Priority species that appear to be at high risk from isolation and loss of genetic variation as a result of past human-induced or natural events. In most instances, these species are known or likely to:
  - have lost substantial areas of habitat or known populations, to the extent that the species is absent from a large part of its former likely range, or significant outlying populations have been lost; or
  - have important populations that are susceptible to a severe and feasible threat (e.g. *Phytophthora cinnamomi* close to a disjunct population of a highly susceptible plant species).
- **Potential Moderate Risk:** Priority species that appear to be at moderate risk from isolation and loss of genetic variation as a result of past human-induced or natural events. In most instances, these species are known or likely to have lost some habitat and known populations, but:
  - the species still occur throughout their former likely range; and
  - important populations are not known to be susceptible to a severe and feasible threat.
- **Potential Low Risk:** Priority species that appear to be at low risk from isolation and loss of genetic variation as a result of past human-induced or natural events. In most instances, these species have lost relatively little habitat and known populations throughout their former likely range, including outlying populations.
- **Unknown Risk:** There are many species that cannot be reasonably placed in one of the above categories. This is mainly because of inadequate information on past or current distribution or threats. Some of these species have only been described in the last few years. These species have not been allocated to High, Medium or Low Risk categories.

It should be noted that some species (particularly plant species) which are classified as Endangered or Vulnerable on Schedules of the Tasmanian *Threatened Species Protection Act* have not been allocated to High Risk or Moderate Risk categories. Many of these species have localised ranges and small populations, but these do not appear to have been adversely affected by past human activities or natural causes, and there is currently a low risk from such events in the immediate future.

It should also be noted that there were difficulties in ascribing a category of genetic risk to some widespread and migratory animal species [mostly birds, such as the swift parrot (*Lathamus discolor*)], which have clearly suffered large population declines since European settlement (and hence loss of genetic diversity) but probably occur across most of their former range. Such species have been allocated to High or Moderate Risk categories.

Results of the analysis are shown separately for fauna and flora species in Appendix 1.3.a and are summarised below in Table 1.3.a. Results for High Risk and Moderate Risk categories have been combined in the table, because the division between species attributed to these two categories is not as clear-cut as the division between Moderate Risk species and Low Risk species.

It is difficult to take account of the short and long-term effects of uncertain or unpredictable events (stochastic or otherwise) on most of the species considered in this analysis, but dramatic reductions in genetic variation in susceptible species could result from some events – they include occurrence of fires at suboptimal intensities, seasons or frequencies; introduction of serious disease or pests [eg *Phytophthora cinnamomi*, bumblebee (*Bombus terrestris*) and European red fox (*Vulpes vulpes*)] into disease- or pest-free locations; and large-scale geomorphic or climatic events causing disruption to localised populations. The latter could include climatic change associated with global warming, which has the potential to adversely affect small or disjunct populations (eg through effects on pollinator-plant interactions; changes in weather and fire patterns). Such situations have not been incorporated into the analysis for Indicator 1.3.a, but it is reasonable to suggest that the species that may be most adversely affected by such scenarios are species that are classified as Endangered or Vulnerable (see Indicator 1.2.a and 1.2.b) and species that are listed under Indicator 1.3.a as being at High Risk of isolation and loss of genetic diversity (see Appendix 1.3.a).

Formal measures to address the risk of loss of genetic variation have been initiated for many of Tasmania's threatened and priority species. They include development of Recovery Plans (which may include ex-situ breeding and establishment programs); habitat restoration and the "Seed Safe" seed collecting program for the Tasmanian Seed Conservation Centre, in partnership with the Kew Millennium Seed Bank. Information pertaining to Indicator 1.2.b gives more details of programs aimed at recovery of threatened species, and protection of populations and habitat through reservation programs on public and private land.

**Table 1.3.a Forest-associated species potentially at risk from isolation and the loss of genetic variation, as a result of past human-induced or natural events**

<b>Group</b>	<b>Potential High to Moderate Risk</b>	<b>Potential Low Risk</b>	<b>Unknown Risk</b>	<b>Total</b>
<b>Vertebrate fauna</b>				
Fish	3	3		6
Amphibians	1	1		2
Reptiles		1	1	2
Birds	6	5		11
Mammals	3	2	1	5
<b>Total</b>	<b>13</b>	<b>12</b>	<b>2</b>	<b>26</b>
<b>Vascular Plants</b>				
Dicotyledons	78	84	32	194
Monocotyledons	17	26	17	60
Pteridophytes	8	5	1	14
Gymnosperms	1	1		2
<b>Total</b>	<b>104</b>	<b>116</b>	<b>50</b>	<b>270</b>

A qualitative degree of risk has been estimated for vertebrate fauna and vascular plant groups (excluding orchids) that are listed as threatened in Tasmania, or are identified as RFA Priority species. A full list of species, and their risk assessment, is given in Appendix 1.3.a.

A range of measures to manage habitat and populations of priority forest-associated species have been implemented through Tasmania's forest practices system. Databases (e.g. Natural Values Atlas), planning tools and field assessment procedures allow threatened species to be considered when forestry operations are planned and undertaken. Assessments are conducted at a strategic or landscape level, and through pre-operational evaluation of specific areas (e.g. coupes or roadlines) proposed for forestry operations. Management actions (typically reservation or management prescriptions which take into account attributes of the species in question) may involve input from researchers and specialist staff of the Forest Practices Authority, the Department of Primary Industries and Water, Forestry Tasmania, tertiary institutions and proponents of proposed activities. Availability of information to inform management decisions is discussed under Indicator 1.2.a.

Case studies which detail genetic attributes and risks to three Tasmanian endemic species, and conservation measures which have been implemented, are given below. Discussions related to Indicators 1.2.b and 1.2.c provide information on other threatened species which are at risk of loss of genetic variation for different reasons. They include: spinning gum (*Eucalyptus perriniana*), which may be subject to genetic contamination from nearby *E. nitens* plantations; and the Tasmanian devil (*Sarcophilus harrisii*), which has suffered a 41 per cent decline in its Statewide population, and near-total losses of some local populations.

Morrisby's gum (*Eucalyptus morrisbyi*) is an endangered species known from four stands in southeastern Tasmania. Molecular studies have confirmed two of the occurrences as remnant patches of the larger stand at Calverts Hill; on South Arm peninsula – this stand comprised about 1915 adult plants in 1991. The most isolated occurrence in East Risdon Nature Reserve (80 adult plants), some 25 kilometres to the northwest of Calverts Hill, is genetically distinct. The genetic distinctiveness of the East Risdon population could be attributed to genetic drift through isolation and differing selection and hybridisation pressures. This population has developed a greater resistance to possum browsing (perhaps as a result of co-occurrence of a wide choice of eucalypt species) and due to greater edge effects may have been affected by hybridisation with surrounding species. The East Risdon population is at high risk of extinction because of stochastic risk associated with its small size and low competitive ability with surrounding species (which may be further reduced by climate change).

A *Eucalyptus morrisbyi* Recovery Plan has been developed (2004–08). A significant effort has been made to establish ex-situ holdings. Successful community campaigns have resulted in the species being preferentially replanted on rural properties and other sites in the South Arm area. Shrubs and creepers have been removed from the immediate vicinity of trees and regeneration in the East Risdon stand to reduce competition to remaining trees. The largest population, at Calverts Hill, has been reserved with funding from the Private Forest Reserves Program.

Miena cider gum (*Eucalyptus gunnii* subsp. *divaricata*) is an endangered species restricted to Tasmania's Central Plateau (extent of occurrence of 1600 km<sup>2</sup> and area of occupancy of 40–50 hectares). *E. gunnii* subsp. *divaricata* forms part of a continuum in the *E. gunnii*/*E. archeri* complex and displays large between-population variation, making it susceptible to significant loss of variation with the loss of any population. The type population displays the most extreme form of the subspecies. All mature trees and saplings in this population have died with only a few repressed seedlings surviving in-situ. Another population has become locally extinct and other populations are in varying stages of decline. Although the total number of trees and seedlings is estimated to exceed 10,000, less than 2,000 are setting seed. Due to fragmentation of the population, and increased distances between mature trees, inbreeding effects are expected to reduce seed set and fitness of juveniles. Evidence from field research conducted over the past two decades indicates declines in the order of 30 per cent may be experienced over the next 100 years.

*Eucalyptus gunnii* subsp. *divaricata* is highly resistant to frost (which has commercial implications for tree breeding programs), but is the most susceptible of the local eucalypt species to drought, partly because of its relatively high palatability to insects, marsupials and stock. Many populations have been grazed by sheep, fired frequently and fertilised. The increased availability of nutrients appears to contribute to higher palatability of regrowth and (already sparse) regeneration, further hindering recovery. Other threats include felling of trees in the course of infrastructure development, and for seeds of this frost-resistant species. Recovery actions include fencing to encourage regeneration,

protection of the species and habitat from direct disturbance, ex-situ plantings and research to mitigate current population decline.

The forty-spotted pardalote (*Pardalotus quadraginatus*) is an endangered, colony-forming species which is restricted to coastal areas of south-eastern Tasmania and a disjunct population on Flinders Island. The total population is estimated at less than 4000 individuals. The species inhabits lowland dry forests and woodland with a high proportion of white gum (*Eucalyptus viminalis*). In south-eastern Tasmania, the species is threatened by human-induced loss and fragmentation of habitat resulting from development in coastal and near-urban areas, inappropriate fire regimes, grazing pressures and non-compliance with prescribed forest management regimes. Colonies are also threatened by less overt actions, including tree dieback and invasion of habitat by aggressive species such as the noisy miner (*Manorina melanocephala*). The vulnerability of the species to stochastic events is demonstrated by loss of a colony on Tasman Peninsula (cause unknown) and severe reduction in numbers on Flinders Island following major wildfires in 2005.

A Recovery Plan developed in 1991 facilitated identification of new colonies and establishment of important reserves on public and private land (currently about 60 per cent of the area of known colonies is reserved). Habitat rehabilitation has occurred on key sites. *Eucalyptus viminalis* forests and woodlands are protected on unreserved public land, and prescriptions to maintain populations have been developed (but not always successfully implemented) on private land. A new Recovery Plan (2006–10) aims to build on initiatives discussed above. Major objectives include further protecting known colonies; increasing size of the populations; and identifying and ameliorating threats to the species.

This approach of this indicator has been to use expert knowledge to classify forest-dependent rare and threatened taxa into categories of risk probability in respect of isolation and loss of genetic variation. The approach will be improved by application of further knowledge of the taxa.

## INDICATOR 1.3.b NATIVE FOREST AND PLANTATIONS OF INDIGENOUS TIMBER SPECIES WHICH HAVE GENETIC RESOURCE CONSERVATION MECHANISMS IN PLACE

This indicator documents the genetic resource management mechanisms put in place to maintain the range of genetic diversity of indigenous timber species used for rehabilitation or commercial purposes, and to avoid the introgression of genetic resources from plantations into native forest stands, especially of rare and threatened species.

Table 1.3.b.1 lists the forest plantation and indigenous timber species for which a commitment has been made for genetic resource conservation in either *in situ* or *ex situ* (or both) situations.

**Table 1.3.b.1 Plantation and indigenous timber species for which a commitment has been made for genetic resource conservation**

Species	In situ	Ex situ	Commitment
<i>Pinus radiata</i>		√	Southern Tree Breeding Association has established a National Genetic Resource Conservation Centre in Mt Gambier to achieve this commitment.
<i>Eucalyptus globulus</i>	√	√	The National Genetic Resource Conservation Centre will store key material for breeding programs. The RFA provides protection through CAR reserve system, Permanent Forest Estate and the Forest Practices Code.
<i>Eucalyptus nitens</i>	√	√	Numerous native stand progeny trials on public and private land.
<i>Acacia melanoxylon</i>	√	√	Forestry Tasmania maintains provenance and progeny trials on State forest. The RFA provides protection through CAR reserve system. Permanent Forest Estate and the Forest Practices Code.
<i>Eucalyptus regnans</i>	√	√	The RFA provides protection through CAR reserve system. Permanent Forest Estate and the Forest Practices Code.
<i>Eucalyptus obliqua</i>	√		The RFA provides protection through CAR reserve system. Permanent Forest Estate and the Forest Practices Code.
<i>Eucalyptus delegatensis</i>	√		The RFA provides protection through CAR reserve system. Permanent Forest Estate and the Forest Practices Code.
<i>Eucalyptus brookeriana</i>	√		The RFA provides protection through CAR reserve system. Permanent Forest Estate and the Forest Practices Code.
<i>Eucalyptus johnstonii</i>	√		The RFA provides protection through CAR reserve system. Permanent Forest Estate and the Forest Practices Code.

The Forest Practices Code prescribes that native forests should be sown with a species composition approximating the natural canopy tree species for the site, making allowance

for those species that will regenerate naturally. Seed to be sown should be collected from the stand to be felled or from the nearest similar ecological zone. Where on-site seed is not available the next option is to use seed from the same climatic and environmental zone as the site to be regenerated using the Seed Zoning Rules (Lockett 1991).

There are formal genetic resource conservation mechanisms in place for plantation species such as described below:

- *Eucalyptus globulus* – Southern Tree Breeding Association (STBA) *E. globulus* breeding program includes base population and advanced breeding population progeny tests on a number of sites throughout Australia. STBA owns and manages the National Genetic Resource Centre at Mt Gambier which contains *Eucalyptus globulus* genetic material. Studies of the genetic diversity in the native populations and breeding population of *E. globulus* have been undertaken at the University of Tasmania and are continuing under the Cooperative Research Centre (CRC) for Forestry. This information has been informing management decisions. Private companies in Tasmania also have substantial plantings of *E. globulus* material collected throughout the range of natural distribution of the species. These have generally been established as base populations for breeding programs.
- *Pinus radiata* - Southern Tree Breeding Association (STBA) *P. radiata* breeding program includes base population and advanced breeding population progeny tests on a number of sites throughout Australia including Tasmania. STBA owns and manages the National Genetic Resource Centre at Mt Gambier which *Pinus radiata* material derived from the original native populations in USA and Mexico. *Ex situ* plantings of *P. radiata* have been documented by CSIRO (Eldridge 1998).
- *Eucalyptus nitens* – *ex situ* base population progeny tests have been established by Forestry Tasmania, Norske Skog and Gunns Ltd. Gunns Ltd and Forestry Tasmania have independent advanced breeding programs. The native populations of *E. nitens* are well represented in CAR Reserves in Victoria and NSW.

Research is currently under way at the University of Tasmania and in the CRC for Forestry to develop strategies to assess and manage the risk of gene flow from *E. globulus* and *E. nitens* plantations. For example the introduction of *E. nitens* as a plantation species on the island of Tasmania is being used as a case study to develop strategies to assess and manage the risk of gene flow from plantations into native forest (see Barbour *et al.* publications listed below). The results of this research are influencing guidelines for plantation establishment.

Genetic diversity in many of the Tasmanian endemic eucalypts has been studied at the University of Tasmania and in conjunction with Forestry Tasmania, Norske Skog and Zinifex, *ex situ* plantings of rare species have been made. Genetic studies of native *E. regnans* and *E. obliqua* are currently being undertaken by the CRC for Forestry to better inform gene pool management and seed transfer guidelines for these species. Work is also currently being undertaken on genetic diversity in *Acacia melanoxylon*, *Nothofagus cunninghamii*, *E. viminalis* and *E. ovata* at the University of Tasmania.

The native *Eucalyptus globulus* gene pool is a nationally and internationally important forest genetic resource. There has been extensive research on the genetic diversity in the native populations in Tasmania, the Bass Strait Islands and southern Victoria over the last decade making this gene pool one of the most extensively studied eucalypt species (reviewed in Potts *et al.* 2004).

There is the possibility of future loss of forest genetic resources through climate change. A possible example is the extensive mortality in specific populations of *Eucalyptus gunnii* on the Central Plateau of Tasmania over the last decade (Potts *et al.* 2001). This species is one of the most frost-resistant of all eucalypts and the most extensive die-back has occurred in some of the most frost-resistant populations. Another possible example is the die-back that has occurred over the last decade in the small, distinctive population of Tasmania's rarest eucalypt species, *E. morrisbyi*, in the East Risdon Flora Reserve (Jones *et al.* 2005).

### References

- Eldridge, K. (1998). Australian radiata provenance trials. Client Report 416. CSIRO Forestry and Forest Products. 25pp.
- Lockett, E.J. (1991). Eucalypt Seed and Sowing. Native Forest Technical Bulletin 1. Forestry Commission, Tasmania. 64pp.
- #### Genetic diversity in *E. globulus*
- Costa e Silva, J., Potts, B.M. and Dukowski, G. (2006). Genotype by environment interaction for growth of *Eucalyptus globulus* in Australia. *Tree Genetics and Genomes* 2, 61-75
- Dutkowski, G.W. and Potts, B.M. (1999). Geographical patterns of genetic variation in *Eucalyptus globulus* ssp. *globulus* and a revised racial classification. *Australian Journal of Botany* 46: 237-263
- Freeman, J., Jackson, H.D., Steane, D.A., McKinnon, G.E., Dutkowski, G.W., Potts, B.M. and Vaillancourt, R.E. (2001). Chloroplast DNA phylogeography of *Eucalyptus globulus*. *Australian Journal of Botany* 49: 585-596
- Jones, R.C., Steane, D.A., Potts, B.M. and Vaillancourt, R.E. (2002). Microsatellite and morphological analysis of *Eucalyptus globulus* populations. *Canadian Journal of Forest Research* 32: 59-66
- Jones, T.H., Steane, D.A., Jones, R.C., Pilbeam D., Vaillancourt, R.E. and Potts, B.M. (2006) Genetic diversity in the Australian National *Eucalyptus globulus* breeding population. *Forest Ecology and Management* (in press)
- McKinnon G.E., Vaillancourt, Steane, D.A. and Potts, B.M. (2004). The rare silver gum, *Eucalyptus cordata*, is leaving its trace in the organellar gene pool of *Eucalyptus globulus*. *Molecular Ecology* 13: 3751-3762

- McKinnon, G.E., Potts, B.M., Steane, D.A. and Vaillancourt, R.E. (2005). Population and phylogenetic analysis of the cinnamoyl coA reductase gene in *Eucalyptus globulus* Labill. (Myrtaceae) *Australian Journal of Botany* 53: 827-838
- Milgate, A.W., Potts, B.M., Joyce, K., Mohammed, C. and Vaillancourt, R.E. (2005). Genetic variation in *Eucalyptus globulus* for susceptibility to *Mycosphaerella nubilosa* and its association with growth. *Australasian Plant Pathology* 34: 11-18
- O'Reilly-Wapstra, J.M., McArthur, C. and Potts, B.M. (2002). Genetic variation in resistance of *Eucalyptus globulus* to marsupial browsers *Oecologia* 130, 289-296.
- Potts, B.M., Vaillancourt, R.E., Jordan, G., Dutkowski, G., Costa e Silva, J., McKinnon, G., Steane, D., Volker, P., Lopez, G., Apiolaza, L., Li, Y. Marques, C. and Borralho, N. (2004). Exploration of the *Eucalyptus globulus* gene pool. Plenary paper In 'Eucalyptus in a changing world' (Eds. N.M.G. Borralho, J.S. Periera, C. Marques, J. Coutinho, M. Madeira and M. Tomé) pp. 46-61. Proc. IUFRO Conf., Aveiro, 11-15 Oct. 2004 (RAIZ, Instituto Investigação de Floresta e Papel, Portugal)
- Rapley, L., Allen, G.R. and Potts, B.M. (2004). Genetic variation in *Eucalyptus globulus* in relation to susceptibility from attack by the southern eucalypt leaf beetle, *Chrysophtharta agricola*. *Australian Journal of Botany* 52(6): 747-756
- Rapley, L., Allen, G.R. and Potts, B.M. (2004). Genetic variation of *Eucalyptus globulus* in relation to autumn gum moth *Mnesampela privata* (Lepidoptera: Geometridae) oviposition preference. *Forest Ecology and Management* 194: 169-175
- Steane, D.A., Conod, N., Jones, R.C., Vaillancourt, R.E. and Potts, B.M. (2006). A comparative analysis of population structure of a forest tree, *Eucalyptus globulus* (Myrtaceae), using microsatellite markers and quantitative traits. *Tree Genetics and Genomes* 2: 30-38

### **Other Tasmanian endemics**

- McGowen, M.H, Wiltshire, R.J.E., Potts, B.M. and Vaillancourt, R.E. (2001). The origin of *Eucalyptus vernicosa*, a unique shrub eucalypt. *Biological Journal of the Linnean Society* 74, 397-405
- Jones, R.C., McKinnon, G.E., Potts, B.M. and Vaillancourt, R.E. (2005). Genetic diversity and mating system of an endangered tree, *Eucalyptus morrisbyi* *Australian Journal of Botany* 53: 366-377
- Potts, B.M., Potts, W.C. and Kantvilas, G. (2001). The Miena cider gum, *Eucalyptus gunnii* subsp. *divaricata* (Myrtaceae): a taxon in rapid decline. *Papers and Proceedings of the Royal Society of Tasmania* 135, 57-61

### **Gene flow from plantations**

- Barbour, R., Potts, B.M., Vaillancourt, R.E., Tibbits, W.N. and Wiltshire, R.E. (2002). Gene flow between introduced and native *Eucalyptus* species. *New Forests* 23 (3): 177-191

- Barbour, R.C., Potts, B.M. and Vaillancourt, R.E. (2003). Gene flow between introduced and native *Eucalyptus*: Exotic hybrids are establishing in the wild. *Australian Journal of Botany* 51: 429-439
- Barbour, R.C., Potts, B.M. and Vaillancourt, R.E. (2005). Pollen dispersal from exotic eucalypt plantations. *Conservation Genetics* 6: 253-257
- Barbour, R.C., Potts, B.M. and Vaillancourt, R.E. (2005). Gene flow between introduced and native *Eucalyptus* species: crossability of native Tasmanian species with exotic *E. nitens*. *Australian Journal of Botany* 53: 465-47
- Barbour, R.C., Potts, B.M., Vaillancourt, R.E. and Tibbits, W. (2006). Gene flow between introduced and native *Eucalyptus* species: flowering asynchrony as a barrier to F<sub>1</sub> hybridisation between exotic *E. nitens* and native Tasmanian *Symphyomyrtus* species. *Forest Ecology and Management* 226: 9-21
- Barbour, R.C., Potts, B.M. and Vaillancourt, R.E. (2006). Gene flow between introduced and native *Eucalyptus*: early-age selection limits invasive capacity of exotic *E. ovata x nitens* F<sub>1</sub> hybrids. *Forest Ecology and Management* (in press)
- Barbour R.C., Potts B.M. and Vaillancourt R.E. (2006) Gene flow between introduced and native *Eucalyptus* species: morphological analysis of tri-species and backcross hybrids involving *E. nitens*. *Silvae Genetica* (in press)
- Potts, B.M., Barbour, R.C., Hingston, A.B., and Vaillancourt, R.E. (2003). Turner Review No. 6. Genetic pollution of native eucalypt gene pools – identifying the risks. *Australian Journal of Botany* 51: 1-25

## **CRITERION 2: MAINTENANCE OF PRODUCTIVE CAPACITY OF FOREST ECOSYSTEMS**

This criterion measures the ongoing productive capacity of forests by monitoring the area of native forests and plantations available for producing timber and other forest products. To the extent possible the sustainable removal of wood and non-wood products is monitored. To ensure long-term sustainability is achievable, the regeneration of native forests and the re-establishment of plantations is measured.

### **INDICATOR 2.1.a NATIVE FOREST AREA AVAILABLE FOR WOOD PRODUCTION, AREA HARVESTED, AND GROWING STOCK OF MERCHANTABLE AND NON-MERCHANTABLE TREE SPECIES**

This indicator is a measure of the capacity of native forests to meet the market for wood products. Its purpose is to summarise changes in the area of land available for timber production over time. In the 2002 Sustainability Indicators Report Indicator 2.1.a applied to all forest. However, in this report the indicator refers to native forest only; plantations are covered in Indicator 2.1.b.

Maintaining an adequate land-base for timber production is an important component in meeting Tasmania's Regional Forest Agreement (RFA) commitment to sustain a minimum production level of 300 000 cubic metres per year of high quality eucalypt sawlog from State forest and yields of special species timbers including up to 10 000 cubic metres of blackwood. The RFA also obliges the State to review the sustainable level of high-quality sawlog production from public land every five years. The native forest area available for timber production is essential to that calculation. This is the best available estimate of the area of native forested land that is likely to be harvested now or at some time in the future.

The source of information on the area potentially available for timber production on public land is Forestry Tasmania's mapped provisional coupes. Provisional coupes define potential harvest operation boundaries by removing areas where logging is not allowed or is highly unlikely. In the first category are formal and informal reserves. In the second are areas restricted by, for example, Forest Practices Code provisions, inaccessibility, uneconomic forest, silvicultural limitations, and logging constraints.

The area of private-forest land potentially available for timber production is not mapped and therefore is not able to be reported. Because the discounting process used to adjust the private-forest resource availability estimates is not specifically area-based, it is not possible to provide a meaningful net area estimate. Similarly, the area harvested is not mapped on all private lands and is also not able to be reported.

As shown in Table 2.1.a.1 the area of native forest potentially available for timber production on public land is 607,000 hectares. This area is not comparable with the figure reported in the 2002 report because it only covers native forest. However, public native forest land potentially available for timber production has decreased, by about 15 per cent over the last five years, partly due to the transfer of land from State forest to the reserve system as a result of the Tasmanian Community Forest Agreement in 2005.

**Table 2.1.a.1 Gross forest area and net forest area available for wood production as at 30 June 2006**

<b>Tenure</b>	<b>Gross forest area (‘000 ha)</b>	<b>Net native forest area (‘000 ha)</b>
Public	2,335	607
Private	1,018	Not available

The area of native forest harvested on public land varies from year to year (Table 2.1.a.1). This activity is driven by sustainable sawlog supply, market conditions and silvicultural prescription. This area includes clearfell, selective harvesting and thinning.

**Table 2.1.a.2 Native forest area harvested**

<b>Tenure</b>	<b>Area harvested (‘000 ha)</b>				
	<b>2001-02</b>	<b>2002-03-</b>	<b>2003-04</b>	<b>2004-05</b>	<b>2005-06</b>
<b>Public</b>	14.9	16.9	17.1	17.5	12.4
<b>Private</b>	not available				

A surrogate for native forest area harvested is the area of native forest approved for harvesting each year, covered by certified Forest Practices Plans. This Forest Practices Authority dataset includes both public and private land tenure. However, it is important to note that actual native forest area harvested is likely to be less than the planned area, and may occur in a subsequent year.

**Table 2.1.a.3 Native forest area approved for harvesting**

<b>Tenure</b>	<b>Area approved (‘000 ha)</b>				
	<b>2001-02</b>	<b>2002-03</b>	<b>2003-04</b>	<b>2004-05</b>	<b>2005-06</b>
Public	15.9	18.3	19.2	17.4	16.0
Private	16.1	17.1	19.6	16.9	14.4
<b>Total</b>	<b>32.0</b>	<b>35.3</b>	<b>38.8</b>	<b>34.3</b>	<b>30.4</b>

Information on growing stock is not available across all tenures and is thus not reported in this Indicator.

## References

Commonwealth of Australia and State of Tasmania (2002). *Sustainability Indicators for Tasmanian Forests 1996-2001*. In Background Report. Inquiry on the progress with Implementation of the Tasmanian Regional Forest Agreement (1997). Resource Planning and Development Commission 2002.

## INDICATOR 2.1.b AGE CLASS OF PLANTATIONS

This indicator provides a statewide summary of the progress of plantation establishment of native and exotic species over time. An increase in the size and quality of the plantation estate is a significant element in the longer-term sustainability and growth of the forest industry in Tasmania. The Tasmanian Regional Forest Agreement (RFA) lists a number of plantation expansion actions under clauses 14, 15, and 16 of Attachment 12. The expected contribution of plantations to sustainable high quality eucalypt sawlog supply from State forest is addressed independently in the review required by Clause 98 of the RFA.

Table 2.1.b.1 reports plantations in five-year age classes at an aggregated State level. This area information is a compilation of GIS data layers contributed by the large forest growers, and independently collected data for the smaller private growers.

A range of species, particularly eucalypts, is planted in Tasmania. However, as the industry has developed, plantations are growing a narrower range of species: the softwood resource is dominated by *Pinus radiata*, and *Eucalyptus nitens* and *E. globulus* dominate the hardwood resource. *E. globulus* is the favoured pulping species, but it grows only in relatively frost free sites. *E. nitens* is the preferred alternative in exposed, frosty or high-altitude sites and is the more widely planted.

**Table 2.1.b.1 Area of Tasmanian plantations in five-year age classes as at 31 December 2005**

Age Classes	Hardwood plantations (ha)	Softwood plantations (ha)
<b>Pre-1971</b>	300	1,800
<b>1971-75</b>	400	2,300
<b>1976-80</b>	700	5,400
<b>1981-85</b>	1,900	9,700
<b>1986-90</b>	10,000	9,600
<b>1991-95</b>	28,200	10,200
<b>1996-00</b>	50,900	17,300
<b>2001-05</b>	66,500	15,200
<b>Total</b>	<b>158,900</b>	<b>71,500</b>

Table 2.1.b.2 indicates the change in area of plantation over the reporting period. In line with Australia-wide trends, the area of hardwood plantations continues to increase at a rapid rate, while the area of softwood plantations in Tasmania has decreased. The later decrease suggests that conversion from softwood plantation to hardwood plantation and other land uses has been occurring.

**Table 2.1.b.2 Plantation Area Trends 2001-2006**

<b>Reporting Year</b>	<b>Hardwood plantations (ha)</b>	<b>Softwood plantations (ha)</b>
2001	117,600	80,400
2006	158,900	71,500
Difference	41,300 (+35%)	- 8,900 (-11%)

The main trends evident are:

- the rapid expansion in hardwood plantation establishment during 2001-06,` increasing in area by 35 per cent or about 41 000 hectares;
- a decrease of 8 900 hectares in the area of softwood plantation, due partly to conversion to hardwood plantation.

## **INDICATOR 2.1.c ANNUAL REMOVAL OF WOOD PRODUCTS COMPARED TO THE VOLUME DETERMINED TO BE SUSTAINABLE FOR NATIVE FORESTS AND FUTURE YIELDS FOR PLANTATIONS**

This indicator summarises the outcomes of timber harvesting activities for the second Tasmanian Regional Forest Agreement (RFA) five-year review period. Strategies for managing public and private timber resources were either in place during the RFA or amended subsequently. These harvesting outcomes are compared with sustainable cut levels to indicate progress of the strategies. Data for the period 2001-05 are presented in Table 2.1.c.1. Clause 98 of the RFA commits the State to five yearly reviews of the sustainable supply of high quality sawlogs from public land. This review is reported independently of this report.

This indicator also reports expected future yields from plantations in Table 2.1.c.2.

### **Public land**

The sustainable cut from public land is based on making available a minimum legislated high quality eucalypt sawlog supply of 300 000 cubic metres per year. Pulpwood supply arises from meeting this sawlog commitment.

Over the period 2001-2005, the sustainable eucalypt sawlog cut for public land was based on the revised strategy developed to satisfy Clause 98 of the RFA (Forestry Tasmania 2002). The strategy was to accelerate sawlog cut in the short term, up to 350 000 cubic metres per year, to support the aims of the Forestry Growth Plan, including new downstream processing and intensive forest management. This strategy, as well as new market opportunities and improved utilisation standards, led to increases in pulpwood production arising from sawlog operations.

On public land, the cut of native forest products has increased since 2001, based on market demand. Nonetheless, the total cut for the period was below the sustainable volume identified in the strategy, as discussed above.

The cut of special species sawlogs (blackwood, celery top pine, myrtle, Huon pine and sassafras) is relatively small and averaged 18 000 cubic metres each year from 2001 to 2005. This volume compares with the targeted annual supply of special species timbers of 18 500 cubic metres (Whiteley 1999). The timber is obtained from selective harvesting of Special Timber Management Units, harvesting blackwood swamps and salvaging scattered trees in eucalypt sawlog harvesting coupes.

Wood production from eucalypt plantations has been a small proportion of the public land cut. Most of the wood produced was from thinnings from stands planted in the early

1990s and from clearfell of older, under-performing plantation sites that are being replanted to meet the goals of the Forestry Growth Plan.

Softwood plantation wood production has remained relatively static over the period. The age class structure of the softwood plantations limits the opportunity to increase the cut in the medium term.

### **Private Land**

The strategy for private-forest management is to maintain, if not increase, the forested area, recognising that infrastructure and agriculture expansion will continue to act as a reducing agent on forest area. The total private-forest resource, in both spatial and product terms, will vary as forest is harvested and reforested or converted to agricultural uses, and as agricultural land is converted to plantations. Because of these variations, most of the production from private land in the medium to long-term is likely to be based on planted forests.

The last wood resource review for private forests was published in 2005 (Private Forests Tasmania 2005). Private owners are not bound by legislative requirements to meet either product or overall wood-supply levels. The 2005 report estimated a total cut of about 3.2 million tonnes annually of all logs from native and planted eucalypt forest would be available over the 2001-2005 period. This level of cut has not been exceeded in any of the last five years.

Private Forests Tasmania collates annual private land removals of wood products through a comprehensive survey of the processors in Tasmania.

Private forest owners' intentions vary and are not able to be detailed over time to develop a similar sustainable sawlog yield as for public land. However, wood flow estimates based on the results of owner surveys and modelling work have provided a continuing yield estimate for the past five years that has indicated an ongoing supply of sawlog from private native forests of over 100 000 cubic metres each year. This is expected to continue for the next five years, but will be reviewed in 2007 as part of the next regular private wood flow review.

As anticipated, harvesting of private-land eucalypt plantations has continued to expand during the period, with increased plantation establishment resulting in an increase in the expected hardwood plantation wood flow compared to earlier forecasts.

Softwood availability estimates for the period 2001-05 were around 510 000 cubic metres for the total of all log products each year. This level of cut is not being achieved. The data suggests this is more likely because the larger plantation owners have shifted their silviculture focus than that area or growth rates were overestimated.

**Table 2.1.c.1 Annual removal of wood on public and private land**

Sales Category	Public Land						Private Land					
	2001 -02	2002 -03	2003 -04	2004 -05	2005 -06	Avg.	2001 -02	2002 -03	2003 -04	2004 -05	2005 -06	Avg.
<b>NATIVE FOREST</b>												
Estimated sustainable cut eucalypt sawlog and veneer log ('000 m <sup>3</sup> )	350	350	350	350	350	350	n/a	n/a	n/a	n/a	n/a	n/a
Actual cut eucalypt sawlog and veneer log ('000 m <sup>3</sup> )	293	332	357	359	330	334	131	93	111	90	65	98
Actual cut Pulpwood ('000 t)	2,600	3,084	3,196	2,983	2,427	2,858	1,669	1,793	1,669	1,629	944	1,541
Actual cut Special species timbers sawlog ('000 m <sup>3</sup> )	17	20	22	17	14	18	n/a	n/a	n/a	n/a	n/a	n/a
<b>EUCALYPT PLANTATION</b>												
Sawlogs and veneer ('000 m <sup>3</sup> )	0	0	0	0	0	0	0	0	6	3	11	4
Pulpwood ('000 t)	36	120	104	118	90	94	511	629	550	799	973	693
<b>SOFTWOOD PLANTATION</b>												
Sawlogs and veneer ('000 m <sup>3</sup> )	428	436	485	478	443	454	154	102	136	124	112	126
Pulpwood ('000 t)	457	496	477	405	433	454	189	206	247	171	218	206

n/a – not available

The key points apparent from this data are:

- On public land the actual average eucalypt sawlog cut for the period 2001-05 is below the determined sustainable yield of 350,000 cubic metres each year.
- On private land there is no sustainable sawlog cut determined; however, the annual all product cut shown here is within the predicted woodflow estimate for each of the five years, 2001-05.

Table 2.1.c.2 translates the data in Table 2.1.b.1 into a predicted wood flow, based on five-year time periods. Two issues should be noted. First, the production schedule includes second-rotation management of existing plantations and new plantings, and second, the data comes from a variety of independent suppliers, with a consequent range of product terminology and definition, particularly for eucalypt plantation.

This wood flow information has been supplied by large growers, with some independent modelling of the small private growers' forests.

**Table 2.1.c.2 Projected wood flow for all Tasmanian plantations in five-year time periods**

Species	Product	Merchantable volume by species and by average annual volume <sup>1</sup> by five year period ('000 m <sup>3</sup> /yr)				
		2005–09	2010–14	2015–19	2020–24	2025–29
Hardwood Species	Pulp (all sources)	1,081	2,675	3,492 <sup>3</sup>	3,840 <sup>3</sup>	3,893 <sup>3</sup>
	Solid Wood <sup>2</sup>	11	204	447	739 <sup>3</sup>	891 <sup>3</sup>
	<b>Total</b>	<b>1,092</b>	<b>2,879</b>	<b>3,939</b>	<b>4,579</b>	<b>4,784</b>
Softwood Species	Veneer and sawlog	640	681	768	804	n/a
	Pulp	503	571	551	430	n/a
	<b>Total</b>	<b>1,143</b>	<b>1,252</b>	<b>1,319</b>	<b>1,234</b>	<b>n/a</b>

<sup>1</sup> This is an average annual volume and will not necessarily be available in every year of the period.

<sup>2</sup> Solid Wood is principally the non-pulpwood product of the tree that may be valuable for a variety of uses, including rotary peeling or sawing. It is expected that, unless there is management intervention, such as pruning, this product will not be suitable for sawing. The varied nature of the intended regime mix between owners makes it difficult at this early stage of the plantation development to realistically dissect products to a greater level of detail. The impact of pruning regimes for sawlog and high quality veneer production, and the contribution to overall wood supply are dealt with in the context of private and public land resource review statements.

<sup>3</sup> Figures include significant predicted output from future rotations, either on new ground or from replanting.

The main trends evident are:

- hardwood solid wood production from plantations will not make a significant contribution to available sawlog volume before 2020; and
- the available veneer and sawlog volume of plantation softwood is expected to remain at about current volumes for the term of the RFA.

### **References**

Forestry Tasmania (2002). Sustainable High Quality Sawlog Supply from Tasmanian Forests. Review No. 2 Planning Branch, Forestry Tasmania.

Private Forests Tasmania (2005). Tasmanian Private Property Woodflow Estimates (2002 – 2031). Private Forests Tasmania.

Whiteley, S.B. (1999). Calculating the sustainable yield of Tasmania's State forests. *Tasforests* 11: 23-31.

## **INDICATOR 2.1.d ANNUAL REMOVAL OF NON-WOOD FOREST PRODUCTS COMPARED TO THE LEVEL DETERMINED TO BE SUSTAINABLE**

This indicator recognises that forests are sources of non-wood products, including for use by Indigenous people, and that it is important to monitor the level of use and, where practical, assess whether that level is sustainable. The values, quantities and use of non-wood forest products are reported on in Indicator 6.2.b.

While there are some statewide data for this indicator available on removal of non-wood products, the data on sustainable yields of these products is very limited. The different levels of available data reflect market driven responses where demand for particular non-wood products determines what, if any, monitoring systems are developed.

There are no data available on indigenous resources collected or used for cultural activities.

### **Honey**

The sustainable yield of honey production from forests has not been determined. Honey production is dependent on seasonal conditions which determine flowering productivity. Honey production steadily increased until the mid 1980s and has fluctuated seasonally at a relatively high level over the last 20 years (see Indicator 6.1.b).

Tasmania's honey industry encompasses 250 registered beekeepers: eight per cent are regarded as fully commercial or semi-commercial operations; 92 per cent are lifestyle/semi-commercial operators. Around 70 per cent of all production is sourced from leatherwood forests in north-west, south-west and south-east Tasmania. Most highly productive sites are located in State forest. However, about 20 per cent are within the Tasmanian Wilderness World Heritage Area.

During the last ten years the number of sites and hives on State forest has been maintained at similar levels. This management of site and hive levels is indicative of sustainable honey production from State forest. Table 2.1.d.1 reports the data for all beekeepers operating on State forest and not just the commercial and semi-commercial operators (Indicator 6.1.b).

While apiary industry data from other tenures are available, they are neither continuous nor reliable nor reported.

**Table 2.1.d.1 Apiary sites and hives on State forest land**

Year	Number of sites	Number of hives
1996-97	343	12,607
1997-98	334	12,311
1998-99	337	12,332
1999-00	334	12,317
2000-01	322	11,212
2001-02	319	12,092
2002-03	323	12,013
2003-04	323	11,880
2004-05	325	12,534

Source: Forestry Tasmania

### Tree Ferns

The harvesting of tree ferns (or manferns) (*Dicksonia antarctica*) is strictly regulated in Tasmania under the provisions of the *Forest Practices Act 1985*.

Tasmanian Tree Fern Tags are issued by the Forest Practices Authority. These tags must remain on the stems at all times to ensure that the origin of tree ferns can be tracked to approved harvesting areas.

Harvesting of tree ferns must be conducted in accordance with a management plan for the sustainable harvesting of tree ferns that has been endorsed by the Australian and Tasmanian governments. Under the current management plan (Forest Practices Authority 2005) harvesting of tree ferns may only occur under a Forest Practices Plan that authorises permanent clearing and conversion of native forest.

It is estimated (Forest Practices Board, 2005) that there are over 63 million individual tree ferns (*Dicksonia antarctica*) occurring in Tasmania's forests. Table 2.1.d.2 identifies the tree fern numbers by land tenure.

**Table 2.1.d.2 Estimated tree fern numbers by land tenure**

Tenure	Wet forest	Other forest	Estimated total number of stems
<b>Formal reserves</b>	13,574,200	3,579,000	17,153,200
<b>Informal reserves</b>	3,849,700	378,100	4,227,800
<b>Public land - State forest wood production areas</b>	24,875,900	1,386,700	26,262,600
<b>Other public land</b>	4,789,200	1,223,400	6,012,600
<b>Private land reserves</b>	11,900	2,600	14,500
<b>Other private land</b>	8,985,200	803,000	9,788,200
<b>Totals</b>	<b>56,086,000</b>	<b>7,372,800</b>	<b>63,458,900</b>

Source: Forest Practices Authority

During the four years 2002-2006 (Table 2.1.d.3) harvesting of tree ferns averaged less than 0.1 per cent per year of the estimated total number of tree ferns (Table 2.1.d.2). These tree ferns were salvaged from native forest being converted to another land use such as forest plantations or agriculture.

**Table 2.1.d.3 Tree fern harvesting**

Financial Year	Number tree fern tags issued
2002-03	64,182
2003-04	54,886
2004-05	61,368
2005-06	45,131

Source: Forest Practices Authority

Tree ferns rapidly recolonise coupes disturbed by harvesting. Spores are dispersed from mature tree ferns retained in streamside reserves or wildlife corridors. Regenerating tree ferns have a height growth rate of 3.5-5.0 cm per year indicating that tree ferns can reach maturity (able to produce spores) and also a harvestable size if required in less than 30 years (Forest Practices Authority, 2005). The available tree fern resource combined with tree fern recolonisation and growth rate knowledge indicate that current harvest levels are well within sustainable yields.

### **Native Seed and Flora Collection**

Seeds are collected by private collectors and Forestry Tasmania principally for their own use in native forest regeneration, propagating nursery stock and the establishment of plantations.

Limited commercial collection services are provided with high quality seed available for most Tasmanian eucalypts and acacias. Seed collection continues to focus on commercially important species, predominantly trees for forest plantations on public and private land and to a lesser extent to service tree planting activities of organizations such as Landcare and Greening Australia. For example, since 2002, anecdotal evidence suggests that *Eucalyptus globulus* seed from Flinders Island provenance is highly sought after for future plantation seedling stock.

Seed collected on private land for commercial horticultural use is not regulated and is likely to be limited in extent. Commercial seed collectors harvesting from public land are small in number and are regulated by permits administered by the relevant public land management agency.

Data are available for seed collection from Forestry Tasmania who provides information on seed weight, origins, site details and germination capacity as standard practice. The annual quantity of seed collected by Forestry Tasmania is shown in Table 2.1.d.4.

**Table 2.1.d.4 Annual collection of native tree seed by Forestry Tasmania**

<b>Year</b>	<b>Raw seed (Kg)</b>
1996-97	2,012
1997-98	1,370
1998-99	564
1999-00	1,278
2000-01	1,712
2001-02	2,320
2002-03	4,765
2003-04	3,301
2004-05	3,408
2005-06	2,028

**Source: Forestry Tasmania**

Only one private operator in Tasmania is collecting wild flora from Crown Land under permit. This activity is carried out under an interim management plan accredited under the national *Environment Protection and Biodiversity Conservation Act 1999* which includes sustainability assessments on 29 target species using systems developed by the Tasmanian Department of Primary Industries and Water (DPIW).

The Tasmanian and Australian Governments are establishing a national framework within which sustainability criteria will be assessed for nominated target species. This research should provide criteria for determining risk and the guidelines for sustainability under which the level of harvesting of native flora is determined. Until this work is finalized the compliance mechanisms for controlling the level of harvesting of native flora cannot be developed. It is anticipated that this work will be completed before the next report on sustainability indicators for Tasmanian forests in 2011.

### **Game**

Brushtail possums, and to a lesser extent wallabies and pademelons, are primarily forest and woodland species whose densities are highest where this habitat is adjacent to agricultural land or disturbed forest.

No estimate has been made of the sustainable yield of brushtail possums or wallabies from forest.

There have been fluctuating markets for skins and meat over the last 30 years. The fluctuations in annual harvest are shown in Tables 2.1.d.5 and 2.1.d.6.

In addition, to targeted markets, there has been culling of these species where browsing of eucalypt seedlings and agricultural crops has been a problem. Some shooters have sold culled animals to prevailing markets for skins or meat.

Since 1985, the Department of Primary Industries and Water has been monitoring population levels of the brushtail possum, Bennetts Wallaby and the Tasmanian pademelon. These results are reported in Indicator 1.2.c and Figure 1.2.c. Hunting or culling has not impacted on populations levels of wallabies, pademelons or brushtail possums across Tasmania indicating that current harvesting of these species is within sustainable levels.

Since 1995, there have been attempts to develop a trade in brushtail possum meat. Tasmania is the only state processing brush tail possum meat for human consumption.

**Table 2.1.d.5 Annual harvest and culling of brushtail possums**

Year	Commercial permits	Est. Commercial harvest
1996	59	13,917
1997	35	12,364
1998	176	10,596
1999	38	11,635
2000	42	55,200
2001	22	4,900
2002	40	1,100
2003	17	1,700
2004	47	120
2005	45	5,672

Source: Department of Primary Industries and Water

**Table 2.1.d.6 Annual harvest and culling of wallabies**

Year	Commercial licences	Game meat produced (kg)	Non-commercial shooting*
1996	113	69,617	4,956
1997	80	58,055	5,926
1998	61	50,974	4,989
1999	50	67,999	4,646
2000	44	61,642	4,392
2001	45	N/A	4,492
2002	49	N/A	4,769
2003	46	8,784	4,391
2004	60	2,630	4,518
2005	52	19,045	4,531

\* Number of wallabies harvested or culled for crop protection and recreational shooting purposes.

Source: Department of Primary Industries and Water

Dry eucalypt forests and woodlands are important to fallow deer for shelter, fawning and resting, though wet forests and rainforests are too dense to be utilised by them.

**Table 2.1.d.7 Annual harvest of deer**

<b>Year</b>	<b>Deer licences</b>	<b>Estimated male deer taken</b>
1996	2,672	580
1997	2,832	600
1998	2,862	592
1999	2,774	544
2000	2,737	760
2001	2,800	877
2002	2,845	946
2003	2,937	1,000
2004	3,135	1,153
2005	3,228	1,261

Source: Department of Primary Industries and Water

The number of licences sold continues to increase, and the DPIW's ability to estimate the number of deer taken has improved through improved information from an increasing number of property owners. The result is an apparent increase in the number of (male) deer taken which is more the result of improving estimates than increasing hunting success.

Increasing numbers of male and female deer are being taken under crop protection permits and from 2002 hunters have been permitted to take two 'antlerless' deer if they have not harvested a male deer. These changes are possible because of improved deer management. There is no evidence to suggest that the harvesting of deer is unsustainable.

### **References**

Forest Practices Authority (2005). Tree fern management plan for harvesting, transporting or trading of *Dicksonia antarctica* in Tasmania. Forestry Practices Authority, Hobart

Forestry Tasmania (2005). *Sustainable Forest Management Report 2004-05*. Forestry Tasmania, Hobart

## **INDICATOR 2.1.e THE AREA OF NATIVE FOREST HARVESTED AND THE PROPORTION OF THAT EFFECTIVELY REGENERATED, AND THE AREA OF PLANTATION CLEARFELLED AND THE PROPORTION OF THAT EFFECTIVELY RE- ESTABLISHED**

This indicator reports the extent of native forest harvested and the success of regeneration effort where this intended. It also enables a comparison of the area of plantations clearfell harvested with the area effectively replanted, and an indication of the success of the planting effort. This indicator was reported as two indicators, one for natural regeneration and one for plantation establishment in the 2002 Sustainability Indicators Report.

Effective regeneration of harvested native forest is required for all forest unless permanent conversion to another land use is approved. Results of regeneration success are only publicly reported for State forest. In native forests, the Forest Practices Code (the Code) prescribes that sowing and planting mixtures must approximate the natural composition of the canopy trees of the harvested forest. The Code requires regeneration surveys after clearfelling to be conducted one year after clearfelling or two years after partial harvesting. Where surveys show survival is less than the required stocking standard re-establishment should be considered. This is achieved through appropriate seed mixtures, natural seeding and the effects of ecological sifting.

Plantations are not necessarily re-established following clearfelling of existing plantations. Environmental (eg inappropriately located on steep slopes or unstable soils), cultural (eg urban expansion) or economic (eg distance to mills, land use change) factors may influence whether a plantation is re-established or an alternative land use and/or tree crop is established. The reason for conversion is not reported.

All forestry operations on public and private land are undertaken under a Forest Practices Plan. Under the *Forest Practices Act 1995*, a Certificate of Compliance must be lodged upon completion of the operations under the plan including whether regeneration/re-establishment has occurred in accordance with the minimal level identified under the Forest Practices Code and Plan. In Tasmania, all of the major plantation growers have internal management systems that provide for assessment of regeneration/re-establishment stocking levels and remedial treatment.

The Forest Practices Authority reports on the extent of planned forest operations across all tenures and the figures provided do not reflect actual completed hectares. On State forest, Forestry Tasmania reports on natural regeneration success and the actual area of plantation established in their public reporting processes. Due to changes in reporting, data are only available in a consistent format from 1999-2000.

Table 2.1.e.1 shows the area (hectares) of native forest planned and approved for clearfell harvesting and planned for reforestation, conversion or non-forest land use since 1999-2000.

Table 2.1.e.2 provides information on plantations planned for reforestation or conversion to non-forest land use since 1999-2000 (when plantation data were collected).

**Table 2.1.e.1 Total area of native forest (public and private) planned for clearfell harvesting and proposed for regeneration, conversion to plantations or non-forest land use 1999-2000 to 2005-06**

<b>Native Forests</b>			
<b>Reporting Year</b>	<b>Clearfelled followed by regeneration by seeding (hectares)</b>	<b>Clearfelled followed by plantation (hectares)</b>	<b>Clearfelled followed by non-forest land use* (hectares)</b>
1999-2000	4,500	13,400	1,910
2000-01	4,650	11,810	1,620
2001-02	3,750	7,660	1,620
2002-03	6,180	5,720	2,700
2003-04	5,080	7,300	1,970
2004-05	4,590	6,460	1,540
2005-06	3,100	12,510	850

\*Non-forest land use is minor on State forest and restricted to infrastructure requirements such as roads, power lines and dams.

In Table 2.1.e.1 most of the area planned for clearfelling followed by regeneration to native forest by seeding is on State forest whereas almost half the area planned for clearfelling following by plantation establishment is on private land.

**Table 2.1.e.2 Total planned area of plantation forest (public and private) harvested and proposed for re-establishment or converted to non-forest land use 1999-2000 to 2005-06**

<b>Reporting Year</b>	<b>Plantation clearfelled followed by plantation re-establishment (hectares)</b>	<b>Plantation clearfelled followed by conversion to non-forest use* (hectares)</b>
1999-00	3,600	50
2000-01	5,230	90
2001-02	5,350	360
2002-03	7,740	130
2003-04	8,250	420
2004-05	6,550	220
2005-06	7,590	510

\*Non-forest land use is minor on State forest and restricted to infrastructure requirements such as roads, power lines and dams – area not reported.

The area of plantation planned for harvesting each year has slowly increased during the period as plantations established in the 1980s and 1990s begin to mature and are therefore ready to be harvested. This trend is expected to continue.

Forestry Tasmania reports annually on the level of regeneration achieved for all harvested native forest operations on State forest. Table 2.1.e.3 shows that Forestry Tasmania has consistently exceeded its regeneration success target of 85 per cent of the regenerated area meeting prescribed stocking standards. Stocking standards specify the minimum levels of growing stock to be retained or regenerated in order to maintain productive native forest after harvesting operations. The required stocking standard is determined by the forest type being regenerated and is based on the number and spatial distribution of acceptable seedlings, saplings or trees that occur within the forest area being assessed.

Regeneration success of eucalypt coupes is reported three years after harvesting operations. Regeneration of rainforest, blackwood swamp and Huon pine coupes is reported at five years after harvesting.

**Table 2.1.e.3 Percentage of regenerated native forest meeting stocking on State forest lands**

<b>Reporting year</b>	<b>Regeneration year eucalypt clearfell and partial logging</b>	<b>Regeneration year rainforest/blackwood swamp</b>	<b>Total area treated (ha)</b>	<b>Total area which achieved standard (ha)</b>	<b>% Area meeting standard</b>
1998-99	1995-96	1993-94	4,006	3,815	95
1999-00	1996-97	1994-95	5,466	5,184	95
2000-01	1997-98	1995-96	4,145	4,011	97
2001-02	1998-99	1996-97	4,808	4,568	95
2002-03	1999-00	1997-98	4,148	3,837	93
2003-04	2000-01	1998-99	5,526	5,141	93
2004-05	2001-02	1999-00	6,569	6,526	99
2005-06	2002-03	2000-01	7,226	6,942	96

There are no data on the re-establishment of plantations on State forest. On private land data are not available for native forest regeneration levels or for the effective stocking of plantations one year after re-planting. However, indirect assessment of re-establishment success is undertaken through the Forest Practices Authority's Certificate of Compliance reporting and the independent audit process (as noted in Indicator 7.1.b).

Certificates of Compliance do not specify regeneration or re-establishment rates achieved but do indicate the level of compliance with the objective specified within a Forest Practices Plan.

The independent audit process assesses whether an effective stocking standard is likely to be achieved following clearfelling in plantations and native forests which are to be re-established or regenerated. This assessment has been carried out since 2000-01, although the methodology has changed.

From 2000-01 to 2002-03 a minimal performance target of 85 per cent was considered acceptable. Table 2.1.e.4 indicates that on average a score of 94 per cent was achieved across all tenures.

In 2003-04 the performance rating system was changed and a minimal compliance rating of three was considered acceptable (with a maximum rating of four). Table 2.1.e.5 indicates that on average an average compliance level of 3.3 was achieved across all tenures from 2003-04 to 2005-06.

**Table 2.1.e.4 Forest Practices Authority's annual audit performance rating for regeneration/re-establishment operations 2000-01 to 2002-03**

	<b>Total for all tenures</b>	<b>Private industrial</b>	<b>Private independent</b>	<b>State forest</b>
2000-01	94	96	88	95
2001-02	94	91	100	95
2002-03	93	97	78	97
<b>Average</b>	<b>94</b>	<b>95</b>	<b>89</b>	<b>96</b>

**Table 2.1.e.5 Forest Practices Authority's annual audit performance rating for regeneration/re-establishment operations 2003-04 to 2005-06**

	<b>Total for all tenures</b>	<b>Private industrial</b>	<b>Private independent</b>	<b>State forest</b>
2003-04	3.4	3.3	4.0	3.5
2004-05	3.0	2.6	2.9	3.4
2005-06	3.6	3.3	3.5	3.8
<b>Average</b>	<b>3.3</b>	<b>3.1</b>	<b>3.5</b>	<b>3.6</b>

## References

Forest Practices Authority (1996-2006). *Annual Reports*. Forest Practices Authority, Hobart

Forestry Tasmania (2001-2005.) *Sustainable Forest Management Reports*. Forestry Tasmania, Hobart

### **CRITERION 3: MAINTENANCE OF ECOSYSTEM HEALTH AND VITALITY**

This criterion focuses on the impacts of pests and diseases on plantations and native forest and on the impact of both planned and unplanned fire on forest.

Understanding the impact of pests and diseases and developing improved and more ecosystem “friendly” control measures is an ongoing process. The current control measures are reported including changes in approaches from those reported in the 2002 Sustainability Indicators Report.

Trends in areas of both planned fires and wildfires by forest type are reported.

#### **INDICATOR 3.1.a AREA AND PERCENTAGE OF FOREST AFFECTED BY PROCESSES OR AGENTS THAT MAY CHANGE ECOSYSTEM HEALTH AND VITALITY**

Native and exotic pests (vertebrate and invertebrate), pathogens and weeds can adversely affect the health and vitality of plantations and native forests as can abiotic stresses such as extreme weather events, fire and nutrient imbalances. Damage to forests from most native insect pests and pathogens is usually widespread at low severity, having little effect on the health of trees. However, occasional outbreaks / epidemics do occur and the resultant damage can adversely affect commercial values, particularly in plantations. It is generally considered that occasional outbreaks / epidemics by native pests and pathogens form part of normal ecosystem processes and have minimal effect on the conservation values of native forests. However, when coupled with significant stresses such as drought, these occasional outbreaks / epidemics can cause widespread mortality and may result in long-term change to affected native forests. Exotic pests, pathogens and weeds pose significant threats to conservation values and many also impact adversely on amenity and commercial values.

In Tasmanian forests, active management of established pests and pathogens, both native and exotic, is directed heavily towards protecting commercial values in plantations. Most plantation owners routinely manage key pests (browsing mammals, leaf beetles, weeds). In addition, formal surveillance to detect health problems is carried out on all plantations on State forest and a limited area of plantations on private land. Limiting the establishment of additional exotic pests and pathogens through effective biosecurity and quarantine measures is an ongoing priority. Key initiatives in this area are: (i) Plant Health Australia developing an industry biosecurity plan for forestry; (ii) the development of a Biosecurity Strategy for Tasmania; (iii) commencement of an urban surveillance program in Tasmania.

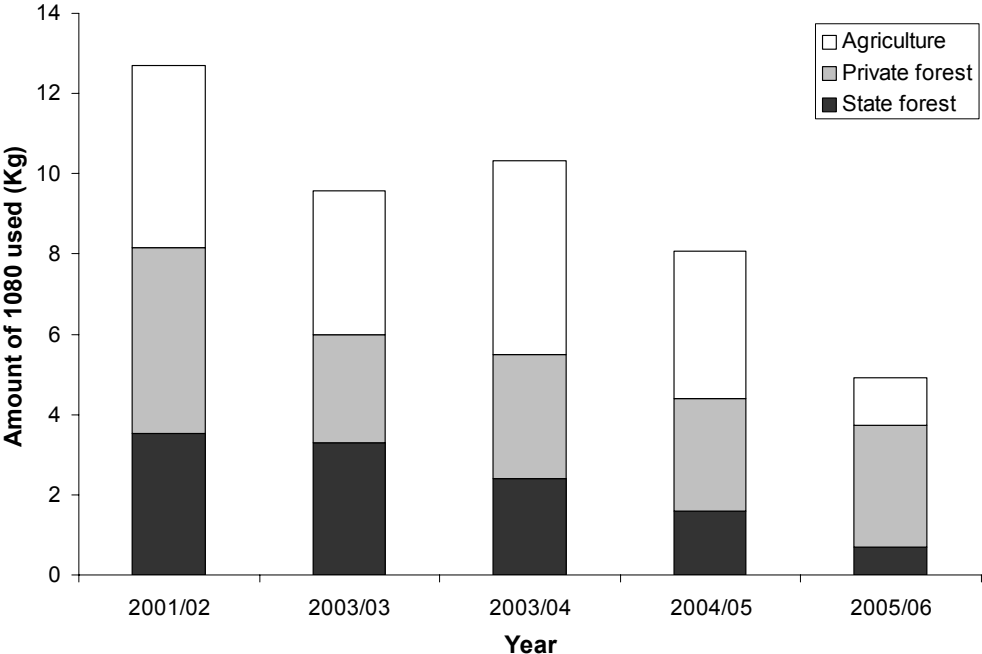
Where chemicals are used to control pests and diseases the manufacturer’s guidelines for use are strictly followed. Chemicals are applied both on the ground and by aerial spraying. The implementation of aerial spraying guidelines determines when spraying can be carried out and minimises the chance of spray drift into streams or onto neighbours properties.

Forestry Tasmania is working towards minimising the use of chemicals and where chemicals are required using more environmentally benign chemicals. For example, spinosad is now preferred over cypermethrin as spinosad has been shown to be more target specific with less potential for off-site effects.

A detailed summary of the factors affecting the health of plantations and native forests in Tasmania each year from 2001 to 2006 is provided in Appendix 3.1.a.

**Main health problems affecting *Eucalyptus* plantations**

Expansion of the *Eucalyptus* plantation estate in Tasmania (predominantly *E. nitens*) continued over the past five years. The spectrum of establishment pests and pathogens has remained the same as the previous five years, with browsing, predominantly by native mammalian herbivores (brushtail possum, pademelon and Bennetts wallaby), still being the major problem. In the three years between 2000-01 and 2002-03, 74 per cent of the 333 eucalypt plantations established on State forest were subject to browsing management operations (Forestry Tasmania, unpublished records). The use of 1080 as the primary means of protecting eucalypt plantations from browsing mammals has declined over the past five years (Figure 3.1.a.1) with alternative culling methods such as shooting and trapping being increasingly used. This trend culminated in the complete cessation in the use of 1080 to manage browsing on State forest after December 2005. Mortality following infection by the root-rot pathogen *Phytophthora cinnamomi* and defoliation of recent transplants by the scarab beetles *Heteronyx* spp. were the only other significant biotic agents affecting plantation establishment. Both affected *E. nitens*, with *P. cinnamomi* being mainly a problem on granitic soils in lowland areas of north-east Tasmania and *Heteronyx* a problem in inland areas of north-west Tasmania. Of the two, only *Heteronyx* is considered significant enough a threat to justify management.



**Figure 3.1.a.1. Amount of 1080 used annually between 2001-02 and 2005-6 on State forest, private forests and agricultural land**  
**Source: Department of Primary Industries and Water**

Damage to established eucalypt plantations from defoliating insects showed a sharp increase in 2004-05 and 2005-06 from the previous year (Table 3.1.a.1). The chrysomelids, *Chrysophtharta bimaculata* and *C. agricola*, remained the major insect defoliators. Populations of the eucalypt weevil, *Gonipterus scutellatus*, significantly increased during the three years between 2002-03 and 2004-05, particularly in lowland areas of southern Tasmania. A probable explanation for these increasing populations was a one to two month lag between weevil egg-laying and significant egg parasitism. Populations of *G. scutellatus* in southern Tasmania subsided in 2005-06 coinciding with a reduced time lag between weevil egg-laying and egg parasitism. Populations of autumn gum moth (*Mnesampela privata*), although widespread throughout northern Tasmania, were rarely high enough to cause significant defoliation. An exception was in 2005-06 when spraying of 540 hectares of plantation on State forest in north-east Tasmania was required to check a developing outbreak. Gum leaf skeletoniser (*Uraba lugens*) is widespread at low populations in young plantations but generally only causes minor defoliation. Sawflies, particularly the large green sawfly (*Perga affinis insularis*) has caused repeated severe defoliation to planted eucalypts in rural areas, particularly through the Midlands. Damage from psyllids, particularly the widespread and common blue gum psyllid (*Ctenarytaina eucalypti*), is generally minor. However, localised outbreaks of *Cardiaspina squamula* and *Hyalinapsis* spp., causing significant levels of premature leaf loss, have occurred in southern Tasmania during the past three years. The only significant disease recorded in young, established eucalypt plantations is Mycosphaerella leaf disease (MLD) of *E. globulus*. An epidemic in 2001-02 in the Circular Head area caused moderate-severe defoliation of about 800 hectares of *E. globulus* plantation resulting in a decision to only plant *E. nitens* on high Mycosphaerella-risk sites on State forest. Young, established eucalypt plantations proved to resilient to the record drought conditions experienced in south-eastern Tasmania in 2002-03 with mortality restricted to small localised patches planted on shallow soils.

**Table 3.1.a.1 Summary of the annual chrysomelid leaf beetle integrated pest management (IPM) program on State forest for the five years between 2001-02 – 2005-06**  
(Numbers in parentheses are areas as a percentage of total area that was monitored)

	2001-02	2002-03	2003-04	2004-05	2005-06
<b>Area monitored (ha)</b>	8,398	9,447	13,137	13,698	16,948
<b>Area of plantations over-threshold (ha)</b>	-	-	2,612	5,533	5,723
<b>(%)</b>			(20)	(41)	(43)
<b>Area of plantations over-threshold that were sprayed (ha)</b>	761	803	955	3,472	3,589
<b>(%)</b>	(9)	(9)	(7)	(25)	(21)

<sup>1</sup> Monitored populations of leaf beetle eggs and larvae that exceed economic injury levels.

There are relatively few health problems affecting mid-rotation plantations. Windthrow after thinning has emerged as a problem on some sites prompting Forestry Tasmania to develop a wind risk model to identify at-risk sites. Localised mortality from attack by insect borers and infection by stem canker pathogens, particularly *Cryphonectria eucalypti* (syn. *Endothia gyrosa*), has been reported on some sites after thinning. It is thought that drought stress is triggering these outbreaks prompting concern of an increasing future issue particularly as the proportion of plantations on low rainfall sites is increasing. For example

the proportion of plantations on State forest in the 800-1000 mm rainfall zone has increased from nine per cent in the period 1995-2000 to 14 per cent in 2001-2006.

### Main health problems affecting *Pinus* plantations

The status of pests and pathogens affecting the *Pinus radiata* plantations remains virtually unchanged from the previous five-year period. Spring needle cast (SNC) and bark stripping by wallabies and brushtail possums are major problems affecting the pine plantation estate. The severity of spring needle cast on State forest was mapped in 1997 as the basis for identifying moderate and high-risk sites. The impact of SNC is managed on these sites using alternative silvicultural regimes and the use of more resistant genetic material. Bark stripping of three to six year-old plantations by wallabies is widespread although mortality resulting from complete girdling of the stem remains confined to hot-spots totally 40-60 hectares. Bark stripping of mid-rotation plantations by possums is restricted to a small number of plantations in the Derwent Valley and south of Burnie that have historically suffered damage.

Populations of Sirex wood wasp increased in at-risk plantations during 2001-02 to 2002-03. The introduction of nematodes in all cases resulted in excellent control. There were no other insect problems of note reported. Tasmania remains free of the five-spined bark beetle (*Ips grandicollis*) and the Monterey pine aphid (*Essigella californica*) remains restricted to plantations in southern Tasmania where, with one exception (Pittwater), it is causing little damage.

Phosphorus and nitrogen deficiencies remain the major abiotic factors affecting the health of the pine plantations, particularly in the drier areas. Symptoms of magnesium deficiency are also widespread, but are thought to be having negligible effect on the health of the plantations. There has been a notable increase in the incidence of lightning strikes in pine plantations across northern Tasmania since 2002-03, although total losses remain low. Windthrow and stem breakage during storm events remains relatively rare and damage restricted to localised areas.

### Native forests

Browsing of young regeneration by browsing mammals is a major factor affecting successful reforestation of eucalypts in native forests. Browsing is a particular risk in coupes harvested and regenerated using clearfall, burn and sow silviculture and coupes that are being managed primarily for blackwood (*Acacia melanoxylon*). For the latter, fencing is the primary method of protection from browsing and is used on all coupes (in the Circular Head area).

**Table 3.1.a.2 Browsing management done in clearfall, burn and sow coupes on State forest**

Year	Area established (ha)	Area in hectares managed for browsing by:		
		1080 (%)	Shooting (%)	Fencing (%)
2001-02	3,274	1,855 (56.6)	36 (1.1)	0
2002-03	2,704	814 (30.1)	202 (7.5)	89 (3.3)

Figures in parentheses are the areas managed by indicated method as a percentage of the area established.

Several drought events since 1990 have caused widespread dieback and mortality across Central Tasmania affecting *E. delegatensis* forests and *E. coccifera*, *E. gunnii* and *E. divaricata* woodlands. The epicentre of these drought events has been the area east of Great Lake. Good regeneration is occurring in dieback-affected stands when the seedlings are protected from stock grazing and browsing. However, some local populations of *E. gunnii* and *E. divaricata* have all but been eliminated after seedling regeneration was grazed by stock. The restoration of these populations will be dependent on seed held in old collections and a pedigree planting in Victoria. Drought has also caused locally severe dieback of trees and understory species in eastern Tasmanian forests. *E. obliqua* and *E. amygdalina* on ridges, *Allocasuarina verticillata* and some understorey species such as the Tasmanian threatened species *Mirbelia oxylobioides*.

There is increasing evidence of foxes in Tasmania. This constitutes both soft evidence such as sighting reports and hard evidence as constituted by scats, carcasses and blood. Although mainland Australian foxes reach their highest densities in a mixture of agricultural and urban areas they maintain significant populations in forest. These trends are reflected in the distribution of evidence in Tasmania. Beyond fringing forest, plantations in rural areas have significant potential as refugia for foxes. Tasmanian forest inhabiting vertebrates are at risk from foxes as are Tasmanian bettong (predation), eastern quoll (predation and competition), southern brown bandicoot, long-nosed potoroo, Tasmanian pademelon, brushtail possum, ringtail possum, small dasyurids, pygmy possums, spotted quail thrush (predation), spotted-tailed quoll, Tasmanian devil (predation and competition), masked owl, brown goshawk and wedge-tailed eagle (competition). Species with a preference for dry, open forest (eg Tasmanian bettong) are most at risk since that habitat is preferred (compared to closed, wet forest) by foxes. Currently common and secure, high-risk species such as the Tasmanian bettong, are likely to quickly become threatened and require special protective measures. Areas where Tasmanian devils have declined below carrying capacity due to Devil Facial Tumour Disease are especially at risk from foxes. Current methods for fox control in Tasmania (fox baiting using 3 mg of 1080 per bait of dried kangaroo meat or Foxoff meat compound, buried at 5-10/km<sup>2</sup>) have a minimal effect on non-target species.

Myrtle wilt caused by the native pathogen *Chalara australis* is the most significant factor affecting the health and vitality of *Nothofagus cunninghamii*-dominated rainforest. Long-term monitoring of the activity of myrtle wilt is done in a set of five permanent plots established across Tasmania. These were last assessed in 2000-01, at which time they registered little myrtle wilt activity. While a formal decision has not been made, these myrtle wilt rate-of-spread plots will probably be moved on to a 10-year re-measurement cycle.

The root-rot pathogen, *Phytophthora cinnamomi*, remains the most significant biotic threat to the health of the native forest in Tasmania. No new susceptible host plant species have been recorded over the past five years but four species recently added to the list of threatened species (*Boronia gunnii*, *B. hippopala*, *B. hemichiton* and *Philothea freyciana*) are in the process of having their susceptibility to *P. cinnamomi* evaluated *in vitro*. Further work was done map areas containing good populations of susceptible plant communities that are a high priority to manage for protection against *P. cinnamomi*. A total of 66 Priority Management Areas are now mapped, 40 of which contain forest communities. Twenty three of the priority management areas containing forest communities have localised infestations of *P. cinnamomi* (four and 19 for production and reserve areas

respectively). Significant new populations of the *Phytophthora*-susceptible threatened species *Epacris barbata*, *E. curtisiae*, *Xanthorrhoea bracteata* and *X. arenaria* were found. Three of these four new populations are free of infection. A total of 100 new positive records for *P. cinnamomi* were added to Forestry Tasmania's database over the five years from 2002 to 2006 (Table 3.1.a.3), with an additional 62 new records from the Department of Primary Industries and Water for conservation areas. There were ten significant new extensions to the known distribution of *P. cinnamomi* in Tasmania: Deadmans Beach, southern Arthur Plains, Craycroft Crossing, Clarke Island, Hunter Island and Lake Selina, in the reserve system and the easterly approach road to Bay of Fires, Arthur-Frankland, Wedge and south eastern perimeter of Dempster Plains in State forest.

**Table 3.1.a.3 Soil testing for *Phytophthora cinnamomi***

Calendar year	Soil tests done	Number positive for <i>P. cinnamomi</i>
2002	33	21 (64%)
2003	24	9 (38%)
2004	53	18 (34%)
2005	46	20 (43%)
2006	48	32 (67%)

Source Forestry Tasmania Host-Pathogen Database

Since mid-2004, 58 quarries used for roading on State forest have been inspected to determine their *Phytophthora* status. Of these quarries, 45 have been certified as currently free of *P. cinnamomi*. One other quarry is under active management to attempt to eradicate a small *P. cinnamomi* infestation.

There is a relative paucity of information about the extent of weed infestation in forests. On State forests, routine forest health surveillance does include the detection of exotic invasive weeds. Gorse is the most regularly detected of these (Table 3.1.a.4) and the great majority of the infestations are very restricted in extent, typically just a few plants. These restricted infestations are treated on the spot with granular herbicide and reported for follow-up monitoring. In 2005-06 health surveillance inspected wildlife habitat strips (WHS) within plantation areas on State forest at points where roads transected them. About half of the WHS inspected reported weeds, with thistles and foxgloves being the most common, comprising 65 per cent of the detections. Most infestations of these weeds were confined to road verges, posing little threat to biodiversity within the WHS. Wildling pines affected 11 per cent of the WHS sampled, particularly those in open dry sclerophyll forests where it showed the potential to spread more deeply into the forest. A targeted survey is being done to better quantify the extent of wildling pine spreading onto native forests adjoining pine plantations on State forest.

**Table 3.1.a.4 Number of occasions that gorse or pampas plants were detected during health surveillance of pine and eucalypt plantations on State forest**

	2001-02	2002-03	2003-04	2004-05	2005-06
<b>Gorse</b>	2	0	22	17	30
<b>Pampas grass</b>	0	0	2	2	3

On reserved land a number of weed management plans are in place to identify the strategic weed control needs, including forest protection. Across the three reserve management regions, one has completed plans, one is half covered by a plan and the third region had developed a draft plan. There are a multitude of weed threats affecting forest ecosystems including many garden escapes such as boneseed, mirror bush (*Coprosma repens*), sweet pittosporum (*Pittosporum undulatum*), bridal creeper (*Asparagus asparagoides*). Fortunately, wet forest and rainforest is highly resistant to weed invasion with only a few species like holly (*Ilex aquifolium*) and Elisha's tears (*Leycesteria formosa*) and blackberry (*Rubus fruticosus* spp agg.) causing localised impacts. A large area of wet forest in the Tasmanian Wilderness World Heritage Area will be protected for blackberry under an eradication program for blackberry that has been underway in South West Tasmania. Reserved dry forests are more broadly impacted by weed invasion but impacts are largely restricted to disturbed environments such as around coastal towns and developments and riparian reserves. There has been a significant reduction in these weed impacts in many reserves over the review period greatly assisted by community based weed control projects under the Natural Heritage Trust Program and the Weeds of National Significance Program.

## INDICATOR 3.1.b AREA OF FOREST BURNT BY PLANNED AND UNPLANNED FIRE

This indicator reports the area and per cent of forest types and tenures burnt by both planned and unplanned fires. Fire is a natural and important part of forest ecosystems in Australia. It may have either a positive or negative impact on forest health and vitality depending on how it occurs and the characteristics of the area. In any forest type the total area burnt, and the proportions of that area burnt by planned and unplanned fires are good measures of management success.

Fire is managed co-operatively by Tasmanian agencies, including the Parks and Wildlife Service, Forestry Tasmania and the Tasmania Fire Service, under the Inter-Agency Fire Management Protocol. This operates seamlessly across land tenures and provides a best practice model for such activity in Australia.

### Planned Fires

Planned fires are defined as those started in accordance with a fire management plan or some other type of planned burning program or wildfire response procedure. Reasons for such fires include: fulfilling the ecological requirements of flora and fauna; the protection of life and property; maintaining and promoting sustainable production values; maintaining cultural resources and practices.

Forestry Tasmania maintains records of areas of State forest burnt by planned and unplanned fires, as does the Parks and Wildlife Service (PWS) for lands managed by that agency.

Total softwood and hardwood plantation areas treated by planned burning do not include areas where non-forest communities have been converted to plantation, (as these will be grass and paddocks), nor the establishment of second rotation plantations where it is assumed that burning does not occur and nutrient cycling is more important than removing debris.

**Table 3.1.b.1 Area (hectares) of forest types burnt by planned fires on State forest**

Forest Type	Year				
	2001-02	2002-03	2003-04	2004-05	2005-06
Dry eucalypt	4,700	6,400	2,900	3,600	3,800
Wet eucalypt	6,900	6,500	4,300	6,700	6,200
Other forest types	0	0	100	600	200
Hardwood plantation	4,200	3,400	5,400	4,700	2,700
Softwood plantation	2,100	400	600	400	400
<b>Total</b>	<b>17,900</b>	<b>16,700</b>	<b>15,300</b>	<b>16,000</b>	<b>13,300</b>

The majority of the planned burns on State forest in the above table, apart from reducing post-logging fuel loads, created a suitable seed bed for the regeneration of native forest or the establishment of new plantations.

The area burnt by planned burning on private land has not been recorded and therefore can not be included in the above table. The TFS issues permits for the lighting of fires during the fire permit period each summer, and records the action of lighting permit fires, but not details of the vegetation type or area burnt by the fire. During the remainder of the year there is no requirement that land owners/ land managers notify the TFS of planned burning operations, or the results of a planned burn, outside the permit period.

## Unplanned Fires

Unplanned fires are defined as those started naturally or accidentally that are not in accordance with planned fire management prescriptions. Usual causes of such fires include: lightning strike, escaped campfires or BBQs, fires accidentally started as a result of sparks from equipment or machinery, fires which are deliberately lit without the necessary permits or authority (and those lit with malicious intent), and escaped planned burns.

**Table 3.1.b.2 Area (hectares) of forest types by tenure burnt by unplanned fires**

Tenure	Forest Type	Year				
		2001-02	2002-03	2003-04	2004-05	2005-06
<b>State forest</b>	Dry eucalypt	15	2,067	9,253	821	192
	Wet eucalypt	121	2,642	8,351	479	87
	Other forest types	54	188	2,711	40	6
	Hardwood plantation	0	16	90	3	0
	Softwood plantation	0	14	51	995	0
<b>Nature conservation reserves</b>	Dry eucalypt	0	4,708	6,857	6,743	316
	Wet eucalypt	135	2,693	5,387	831	16
	Other forest types	7	629	23,142	877	11
<b>Other Crown land</b>	Dry eucalypt	0	1,000	546	16	22
	Wet eucalypt	1	111	100	34	1
	Other forest types	1	31	52	12	7
	Softwood plantation	0	1	56	0	0
<b>Private land</b>	Dry eucalypt	3	15,474	2,800	381	100
	Wet eucalypt	41	1,572	557	73	13
	Other forest types	0	365	210	166	13
	Hardwood plantation	0	97	40	0	3
	Softwood plantation	0	860	0	1	0
<b>Total</b>	<b>All</b>	<b>378</b>	<b>32,468</b>	<b>60,203</b>	<b>11,472</b>	<b>787</b>

Areas burnt which are identified as “logging slash” in agency reports have been split equally between open and closed eucalypt forest. This is a good approximation of the proportion of each type in the area harvested annually by Forestry Tasmania. The same proportional allocation has also been applied to other land tenures on which the vegetation burnt has been identified as logging slash.

The total land area for each of the tenure classifications used in Tables 3.1.b.1 and 3.1.b.2 has changed during the reporting period. This is a result of commercial land transactions by Forestry Tasmania and also to tenure changes arising from the Regional Forest Agreement and the Tasmanian Community Forest Agreement. The major changes have been from unallocated Crown Land to several classes of conservation reserve and from State forest to conservation reserve. This will affect calculation and comparison from year to year of the percentage area burnt by tenure figures.

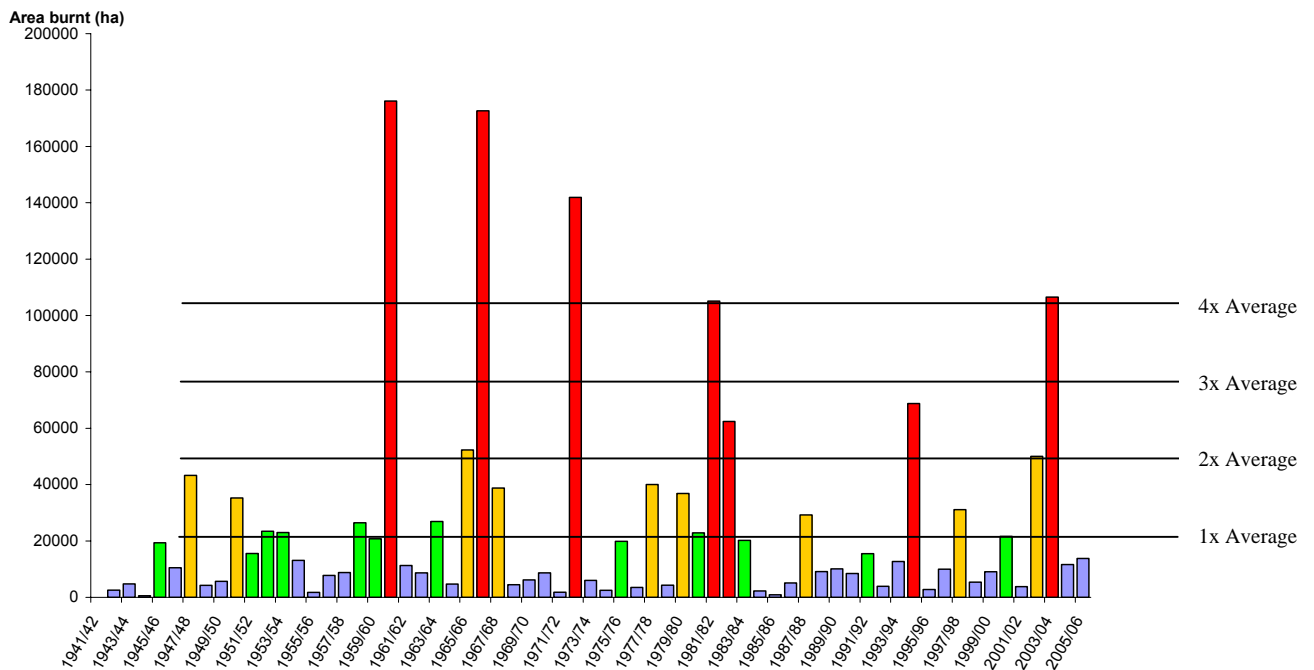
Forestry Tasmania records of the areas of State forest burnt by wildfire and the PWS records of the area of reserved land burnt by wildfire are more reliable and comprehensive than the Tasmania Fire Service’s records of the areas of private land burnt by wildfire. In addition to the wildfires recorded as occurring on private land, it is likely that there are additional unplanned fires that are not reported to the TFS and so are not included in the records. Consequently the recorded area burnt by wildfire on private land is certainly understated but to what extent is unknown.

Forestry Tasmania’s records dating back to 1941 show that the five wildfire seasons 2001-02 to 2005-06 were mild in comparison to previous seasons.

The episodic nature of Tasmania’s fire seasons can be seen in the following chart of area burnt per season by fires attended by Forestry Tasmania personnel. Because not all of these fires were confined to State forest the “area burnt” depicted for each year in this chart is greater than the area of State forest burnt in that year.

**Figure 3.1.b.1: Total wildfire area attended by Forestry Tasmania from 1940/41 (compared to long-term average of 28,300 hectares per year)**

**Data includes all vegetation types**



A similar episodic pattern of area burnt will be seen using any Tasmanian agency data.

The apparent severity of the 2003-04 season is exaggerated by the inclusion of a single buttongrass moorland (non-forest) fire that burnt approximately 80 000 hectares, and on which only limited suppression action was taken.

## **CRITERION 4: CONSERVATION AND MAINTENANCE OF SOIL AND WATER RESOURCES**

This criterion monitors the area of forest across Tasmania managed primarily for catchment protection values. Management procedures put in place, including their implementation, to mitigate against the risk of soil erosion and minimise the risk to soil physical properties, water quality and water quantity are also reported.

### **INDICATOR 4.1.a AREA OF FOREST MANAGED PRIMARILY FOR PROTECTIVE FUNCTIONS**

This indicator reports the area of forest land managed for the protection of soil and water values.

Soil and water values are protected on forest land in Tasmania through a range of measures, with two key mechanisms being the *Forest Practices Code 2000* and the *Tasmanian Reserve Management Code of Practice 2003*.

The Forest Practices Code provides specific management prescriptions to be applied to forest practices as defined by the *Forest Practices Act 1985* on any forest lands, particularly those activities associated with roading, harvesting or reforestation. The objectives of the Forest Practices Code provisions in relation to soil and water are to minimise soil erosion, compaction, nutrient loss and landslides and to maintain acceptable water quality and flow. This code applies over private land, multiple use State forest and unallocated Crown land.

Soil and water values are also afforded protection across the range of nature conservation reserves in Tasmania. The *Tasmanian Reserve Management Code of Practice 2003* applies to all terrestrial reserves managed under the *National Parks and Reserves Management Act 2002*, the *Forestry Act 1920* and the *Crown Lands Act 1976*. The Reserve Management Code's provisions for soil and water aim to maintain or restore the natural quality of water and to maintain or restore natural soil processes and avoid soil degradation, within reserved lands.

#### **Area of forest where disturbance activities which impact on soil and water values are excluded**

Four key disturbance activities that can directly affect soil and water values in forested areas include roading, timber harvesting, burning and recreation activities. The only one of these activities that is broadly excluded from substantive areas of land in Tasmania is timber harvesting. The other three activity types listed are rarely fully excluded from any particular categories of land. However, the potential impacts of these activities are managed through codes of practice, such as those described above. Asset planning for recreation facilities on reserves managed under the *National Parks and Reserves Management Act 2002* shows that the vast majority of land area in reserves is not actively used for recreation by way of roads, tracks etc. Hence although recreation activities are not excluded from the majority of reserved land, by virtue of the small area of land

occupied by access and other visitor infrastructure, at least 98 per cent of the area of nature conservation reserves is not subject to disturbance activities which impact on soil and water values.

Table 4.1.a provides the area of forest land, within each of the four main land tenure categories, where timber harvesting is excluded. The total area of land excluded from timber harvesting across all categories of land in 2006 is 1 673 000 hectares.

**Table 4.1.a Area of forest where timber harvesting is excluded, by tenure**

Reporting Date	Land Classification (Tenure)				Total area excluded (ha)
	Multiple use forest (ha) (a)	Nature conservation reserve (ha) (b)	Other publicly managed land (ha) (c)	Private freehold land (ha) (d)	
June 2001	368,300	1,104,500	80,400	2,800	1,556,000
June 2006	419,000	1,121,000	85,000	48,000	1,673,000

**Notes:**

(a) The figures provided in this column include only those forested areas of Multiple Use Forest that are not available for timber harvesting, including areas in informal reserves and areas that are too steep or inaccessible or otherwise excluded by the provisions of the Forest Practices Code.

(b) The Nature Conservation Reserve category includes all formal reserve categories within the CAR reserve system. The figures given in this column equal the total area of native forest in nature conservation reserves in Tasmania as in all of these reserve classes timber harvesting is not permitted (although small scale timber harvesting may be undertaken as part of other approved activities).

(c) This category of tenure broadly includes informal reserves, Commonwealth land and unallocated Crown land. As timber harvesting is generally excluded from these land tenures the figures given in equal the total area of native forest on "other publicly managed land".

(d) The figures provided in this column include only those areas of native forest on private land that are within the CAR reserve system (eg conservation covenants, private nature reserves).

During the reporting period 2001 to 2006 the main trends evident from the data provided in Table 4.1.a are:

- There has been a net increase of 50 700 hectares, or 13.8 per cent, in the total area of forest excluded from timber harvesting within Multiple Use Forest. This is primarily due to the increase in area of informal reserves on State forest together with more areas being excluded from coupes for a range of reasons including steepness, potential erosion hazard and access.
- There has been a net increase of 16 500 hectares, or 1.5 per cent, in the total area of forest in nature conservation reserves (see also Indicator 1.1.c).
- There has been a net increase of 4 600 hectares, or 5.7 per cent, in the total area of forest in informal reserves on other publicly managed land.

- There has been a net increase of 45 200 hectares in the total area of forest excluded from timber harvesting on private land. This is a substantial increase on the 2 800 hectares in 2001 reported in the 2002 Sustainability Indicators Report. The increase is due to the increase in area of forest protected within conservation covenants or other private reserves over the last five years through a range of private land conservation programs (eg Private Forest Reserves Program, Protected Areas on Private Land Program, Non-forest Vegetation Program).
- In total there has been an increase of 117 000 hectares or eight per cent of forest across all tenures where timber harvesting has been excluded reducing potential disturbance to water supply catchments.

### **Area of forest in catchments managed primarily to provide water for human or industrial use**

Tasmania has large areas of forested catchments within the CAR reserve system. Many of these catchments are used for water harvest for domestic or industrial use, although the majority of these are not explicitly reserved as water catchment areas. However, under the *National Parks and Reserves Management Act 2002*, all reserve classes have as one of the statutory management objectives the requirement “to preserve the quality of water and protect catchments”. Two reserves where the role as drinking water catchments is explicitly recognised are Wellington Park and Mt Field National Park. The slopes of Mount Wellington are specifically set aside and managed for town water supply to Hobart and adjacent localities. The *Wellington Park Management Plan 2005*, developed under the *Wellington Park Act 1993*, includes management goals, one of which is the management of water catchments in the park as sources of clean water. The Lake Fenton/Lady Barron Creek drinking water catchment covers 1530 hectares of the Mt Field National Park and supplies 20 per cent of drinking water for Hobart and environs. The *Mt Field National Park Management Plan 2002* identifies the importance of the catchment for drinking water and provides controls on use and works in the catchment to protect water quality.

There is no statewide area figure available for forest in catchments explicitly managed for water harvest. The total area of forested catchment (ie forest land) in the CAR reserve system is provided in Indicator 1.1.c.

### **Area of environmental plantings of trees on previously degraded or cleared sites, to improve the protective function for soil and water values**

In the last five years environmental plantings of trees in Tasmania have been largely undertaken through government funded programs such as the Australian Government’s Natural Heritage Trust and the National Action Plan for Salinity and Water Quality. In 2004-05 these two programs combined reported 134 hectares of plantings across the three Tasmanian Natural Resource Management Regions. This included 70 hectares of plantings to enhance or rehabilitate native vegetation and 64 hectares of exotic species plantings. In 2005-06 the two programs reported plantings to enhance or rehabilitate a combined total of 46 kilometres of riparian vegetation, equating to approximately 100 hectares.

## **INDICATOR 4.1.b MANAGEMENT OF THE RISKS OF SOIL EROSION AND THE RISKS TO SOIL PHYSICAL PROPERTIES, WATER QUANTITY AND WATER QUALITY IN FORESTS**

Indicator 4.1.b reports the extent to which the risks to the physical properties and distribution of soils, and the risks to water quality and quantity in Tasmanian forests have been explicitly assessed and addressed in forest management. This Indicator combines risks to soil and water values as the interaction between forest activities and these values is complex and amelioration practices generally improve both soil and water values.

The 2002 Sustainability Indicators Report focused on the area of forest assessed for erosion hazard. The scope of this indicator has been broadened and now focuses on the knowledge base and processes that are in place to protect soil and water values.

Maintaining soil and water values in forests is critical to sustainable forest management as:

- soil erosion usually reduces soil fertility and affects stream water quality and sediment load;
- physical degradation of soils, including compaction and redistribution, can affect seed germination, growth and survival of trees and can lead to increased water runoff and erosion;
- it is important to maintain water supply to downstream users (including the natural ecosystem and commercial and domestic users) while recognising that stream flow and groundwater recharge will respond to climatic variation, and seasonal and natural changes as forests age or are burnt by wildfire;
- developing a baseline for reporting is difficult as determining water quality is a complex issue. For example, turbidity and suspended solids in Australian drinking water in pristine catchments can exceed recommended standards due to high natural tannins or organic matter or movement of material (organic and inorganic) during extreme weather events such as floods.

Changes in water quality can impact on aquatic biodiversity. The maintenance of biodiversity is addressed in Criterion 1.

The use of chemicals in forest management can potentially impact on water quality. The maintenance of ecosystem is addressed under Criterion 3.

## **Catchment Level Water Values**

Research suggests that many factors determine the spatial and temporal impacts of forest activities on soil and water characteristics and these factors are difficult to measure and monitor within forest management systems at the local or coupe level.

Research at the catchment level has shown that whilst these activities have the potential to influence the hydrological and ecological characteristics of river systems (Bunce *et al.* 2001; Davies *et al.* 2005), most Tasmanian rivers are healthy.

In 2001 the Forest Practices Board (now Authority) commissioned the study, *An Analysis of the Growth of Eucalypt Forests on Launceston's Water Supply* by O'Shaughnessy and Bren which indicated that for the last 80 years there has been "no visible impact of logging on the water flow".

In 2003-04 Forestry Tasmania monitored water at 361 sites downstream of plantation forests where chemicals were used. No added chemicals were detected at 344 sites. At 15 sites, added chemicals were detected but at concentrations well below Australian drinking water guideline values. In 2004-05, a further 410 sites were monitored with only three detections, again at concentrations well below drinking water guideline values.

The Department of Primary Industries and Water (DPIW) maintains an extensive water quality and river health monitoring network in Tasmania's major rural catchments. Water quality is regularly monitored at 52 sites for a range of nutrients, turbidity, dissolved oxygen and pesticides. River health is monitored at 60 sites. In four catchments with significant forestry activities flood waters are also sampled for a range of pesticides.

The monitoring undertaken by the DPIW, combined with the findings from the previous 12 'State of River' reports and a major river health study carried out between 1994 and 2002, indicated that streams within catchments with significant forestry operations were as healthy as those without such operations.

## **Assessment of Risk**

As noted previously, the effect of forest practices on soil properties is not routinely monitored at the coupe level because of the difficulty of obtaining meaningful results, but effects have been investigated in research projects (Harwood and Jackson 1975; Laffan *et al.* 2001; Pennington *et al.* 2001).

These studies and the stream studies referred to above have enabled the major drivers of change to be identified, enabling ameliorative forest management and associated monitoring to targeted systems deemed to have the greatest risk.

Forestry land use activities that increase the risk to soil and water values are the timing of road building, the scale and spacing of roads (including alignment and density), and

dispersion of timber harvesting operations in catchments, thinning or clearing, weed control and change of land use in catchments, operations in or near streams or riparian areas, construction of dams and bores, the diversion of water courses, drainage from roads, cording and matting, snagging or use of temporary tracks, landing positions, landing size and management, soil compaction, wet weather shutdowns, selection of machines and tyres, traffic restrictions on slopes, restricting clearing on steep slopes, infrastructure development and areas managed for tourism and recreation (particularly those near visitor facilities). Fire can also have an impact on soil and water resources.

The recording of preventative measures designed to limit soil and water damage, the auditing of the implementation of management guidelines at the operational scale and the assessment of rehabilitation after forestry operations are considered to be meaningful indicators. Compliance with codes of practices and other regulatory instruments or management guidelines is also a useful measure.

The *Forest Practices Code 2000* and support manuals (as listed below), other regulatory instruments (which are listed in Indicator 7.1.a and apply to public and private lands at different scale), environmental certification schemes (such as the Australian Forestry Standard and ISO 14001) and internal agency or company operational guidelines provide the benchmarks against which the management of soil and water values can be assessed.

The Forest Practices Code 2000 support manuals which apply to management of soil and water values include:

- Soil
  - Forest Soil Fact Sheets
  - Forest Soils of Tasmania
  - Quarry Code of Practice
  - A method for assessing the erodibility of Tasmanian forest soils
  - Basalt Talus Guidelines
  - Dolerite talus Guidelines
- Water
  - Estimation of Peak Flows for Small to Medium Sized Rural Catchments
  - A Guide to Riparian Vegetation and its Management
  - Riparian Land Management Technical Guidelines
  - New Guidelines for the Protection of Class 4 streams

Assessments for soil and water risks occur when a forest activity is carried out under the *Forest Practices Act 1985* irrespective of land tenure or forest type. Assessments are also commonly undertaken on public (including conservation) forests) and large industrially managed private forests in relation to road and other site developments (eg major recreation facilities, ongoing maintenance or infrastructure) not specified under the *Forest Practices Act 1985*. Forest activities not specified under the *Forest Practices Act 1985* are not reported.

Tables 4.1.b.1 and 4.1.b.2 indicates the extent to which legally and non-legally binding instruments in Tasmania address the risk using the subjective four level scale as indicated below to soil and water value for the specified forest management and operations. There has been no change in the way both legally and non-legally binding instruments address the risk to soil and water values during the reporting period.

**Subjective level scale used to determine the extent to which instruments address the risk to soil and water values for the management disturbance activities in Tables 4.1.b.1 and 2**

<b>1</b>	The instruments require the following components to be taken into account in addressing the risk to soil and water values from disturbance activities: 1) Slope 2) Erosion processes (wind, sheet, rill, gully, tunnel, stream bank, wave and mass movement). 3) Soil characteristics (erodibility, compactability, soil moisture) 4) Rainfall intensity 5) Water yields; age structure and proportion of forest in catchments 6) Streams and drainage depressions: size, location and number 7) Management practices (such as cording of snig tracks, road drainage, stream crossings)
<b>2</b>	The instruments address most of the components listed at 1 but do not specify all subjects or are limited in their application.
<b>3</b>	The instruments mention the need for addressing risks when conducting disturbance activities but do not specify the components listed above.
<b>4</b>	The instruments do not mention the need for addressing risks to soil or water values.

**Table 4.1.b.1 Extent to which legally binding instruments address the risk of soil and water values for the management disturbance activities listed**

Disturbance type	Multiple use forest		Nature conservation reserves		Other Crown land		Private	
	2001-02	2005-06	2001-02	2005-06	2001-02	2005-06	2001-02	2005-06
Mineral exploration/ mining/ quarries	1	1	1	1	2	2	2	2
Native forest harvesting & silviculture, including related road/trail construction and/or maintenance	1	1	1	1	1	1	1	1
Plantation operations	1	1	1	1	1	1	1	1
Road/trail construction or maintenance (not related to forestry operations)	1	1	1	1	3	3	4	4
Walking trail construction or maintenance	1	1	1	1	3	3	4	4
Utility corridors	1	1	1	1	3	3	3	3
Fire management	1	1	1	1	3	3	4	4
Tourism/recreation developments and mgt	1	1	1	1	3	3	3	3

**Table 4.1.b.2 Extent to which non-legally binding instruments address the risk of soil and water values for the management disturbance activities listed**

Disturbance type	Multiple use forest		Nature conservation reserves		Other Crown land		Private	
	2001-02	2005-06	2001-02	2005-06	2001-02	2005-06	2001-02	2005-06
Mineral exploration/ mining/ quarries	1	1	1	1	-	-	2	2
Native forest harvesting & silviculture, including related road/trail construction and/or maintenance	1	1	1	1	-	-	2	2
Plantation operations	1	1	1	1	-	-	2	2
Road/trail construction or maintenance (not related to forestry operations)	1	1	1	1	-	-	2	2
Walking trail construction or maintenance	1	1	1	1	-	-	3	3
Utility corridors	1	1	1	1	-	-	3	3
Fire management	1	1	1	1	-	-	3	3
Tourism/recreation developments and management	1	1	1	1	-	-	3	3

**Note:** Many larger industrial private forest managers have developed internal systems which include an assessment of the risks to soil and water resulting from management activities. These formal systems are more sophisticated than those undertaken by independent private forest managers (which vary in quality and complexity). In addition, environmental certification systems provide an additional level of compliance audit for some public and private forest owners.

## Knowledge Base

The *Forest Practices Act 1985* requires that “all forests practices are conducted in accordance with the *Forest Practices Code*”. The Code underpins Tasmania’s forest practices system whose objective is “to achieve sustainable management of Crown and private forests with due care for the environment...” In accordance with the Act’s objective, the Code provides a set of practical guidelines and standards for the protection of environmental values (including soil, and water quality and flow) during forest planning and operations.

- Soils
  - *Section D1: Soils*, details prescriptions and principles which underpin operations in order to protect soil values. This includes a guide for identifying a soil’s erodibility class (Appendix 6 of the Code). Erodibility class then influences operational prescriptions and limitations (as specified in Tables 2, 3, 5, 6 and 10, and Appendices 3, 4, 5 and 6 of the Code) designed to ameliorate the impact of forest activities on soil values.
- Water

- *Section C4: Water Quality and Watercourse Protection* and *Section D2: Water Quality and Flow* focuses on prescriptions and principles which protect all water catchments and watercourses identified during planning and operational activities within forests. Specific guidelines include culvert spacing along roads (Table 2), wet weather harvesting criteria (Table 3 and 5) and wet weather limitations (Section C2) and the establishment of streamside reserves and machinery exclusion zones (Table 8).

The Forest Practices Authority website ([www.fpa.gov.au](http://www.fpa.gov.au)) also provides landowners and managers access to keys to soils and soil and water fact sheets and manuals which support the *Forest Practices Code 2000*, and include:

- Soils
  - Soils in Cambrian sediments and volcanics (13 soils).
  - Soils in dolerite and sediments derived from dolerite (14 soils).
  - Soils in granite and sediments derived from granite (24 soils).
  - Soils in granodiorite (6 soils).
  - Soils in Permian sediments (12 soils).
  - Soils in Triassic sandstone and sandstone-dolerite mixtures (10 soils).
  - Soils in Mathinna Beds (16 soils).
- Water
  - New Guidelines for the Protection of Class 4 streams
  - Forest Sinkhole Manual.

Soil and water identification, management and support documents, combined with ongoing research and training, and the experience of forest managers ensure that sufficient knowledge is available for the identification and mapping of soil types and water courses, and recording their characteristics and distribution. This knowledge base enables risks arising from the interactions between slope, climate, soil type, rainfall, stream management, and vegetation cover to be assessed and managed.

The Parks and Wildlife Service has established an ongoing recreation impact monitoring program, mainly in the Tasmanian Wilderness World Heritage Area, that consists of over 550 sites. Soil data are regularly recorded as part of this program.

Using the following qualitative ratings as a guide, an assessment of the comprehensiveness and appropriateness of the knowledge base within Tasmania for managing the risk of soil erosion on each tenure is detailed in Table 4.1.b.3.

<b>Soil and water Knowledge Base Interpretation</b>
1. Knowledge well developed, including: published research, GIS tools, decision support tools, codes of practice, local knowledge and training, site specific research/models
2. Reasonable knowledge of impacts of activity on listed value, includes local knowledge and training, codes of practice
3. Some local knowledge of impacts of activity on listed value, not in codes, research publications
4. Minimal knowledge - general principles but untested in this landscape
5. No knowledge, not in a position to assess and manage the risk.

**Table 4.1.b.3 Comprehensiveness and appropriateness of the knowledge base for the management of the risk of soil erosion**

<b>Tenure</b>	<b>Scale of knowledge</b>	<b>Narrative on the knowledge base of soil and water values</b>
Multiple use forest	1	Major areas of State forest in northern Tasmania have been mapped at 1:250000 scale; 95 soil types with differing properties and erosion risks have been identified throughout the state, mostly in multiple use State forest; areas at risk from erosion are identified in plans and protected or managed appropriately following the Forest Practices Code; advice is given through the FPA; notification to the FPA is obligatory for high and very high erodibility soils and for moderate to high erodibility soils on steep slopes; landslides are recorded on a joint FPA/MRT database; research is being conducted on erosion by headwater streams; several papers have been published on erosion by headwater streams; regular training given to foresters and forest managers
Nature conservation reserves	2 and 3	Limited knowledge, generally site specific in areas of management interest eg. WHA walking tracks, campsites; some publications; managed by and Parks and Wildlife Service.
Other Crown land	3, 4 and 5	Few publications; limited knowledge, generally site specific; managed by Parks and Wildlife Service; remote areas have very limited knowledge ('5' classification)
Private	2	One private company (Norske Skög) has mapped the soils of its forest estate; other companies conduct soil surveys on an <i>ad hoc</i> basis, generally pre-purchase or before operations begin; soil database is less complete than for multiple use forest (see above) but procedures to identify and manage risks are similar, viz.: areas at risk from erosion are identified in plans and protected or managed appropriately following the Forest Practices Code as for multiple use forest above.

## Auditing of Practices

Forestry Tasmania and Gunns Limited have established environmental management systems (accredited under ISO 14001 and the Australian Forestry Standard (AFS)) under which legally binding instruments (including, but not restricted to, the *Forest Practices Act 1985*) and are formally and externally assessed by independently certified auditors.

Auditing of forest practices which have been carried out under a Forest Practices Plan certified under the *Forest Practices Act 1985* are also undertaken by the Forest Practices Authority on all tenure classes (as noted in Indicator 7.1.b: Independent audit of forest activities). Conservation forest, other crown lands and private forests are not externally audited unless subject to a Forest Practices Plan or AFS certification audit.

Table 4.1.b.4 indicates that the level of auditing on forest lands in Tasmania has not changed during the last five years. It is important to note that private forest managers include industrial forest managers who are subject to external audits (at various levels), while smaller private forest operations may not always be audited.

### Subjective rating applied to determine Table 4.1.b.4

<b>1</b>	Legal/ non-legal mechanisms exist for managing the risk of soil and water values comprehensively and are subjected to regular external audit
<b>2</b>	Legal/ non-legal mechanisms exist for managing the risk to soil and water values comprehensively but are not subjected to regular external audit
<b>3</b>	There are no legal/ non-legal mechanisms exist for managing the risk to soil and water values and there is no auditing to assess the extent of impacts.

**Table 4.1.b.4 The level (1 - 3) of processes applied to manage the risk to soil and water values**

	Multiple use forest		Nature conservation reserves		Other Crown land		Private	
	2001-02	2005-06	2001-02	2005-06	2001-02	2005-06	2001-02	2005-06
Mineral exploration/ mining/ quarries	1	1	2	2	2	2	2	2
Native forest harvesting & silviculture, including related road construction and/or maintenance	1	1	1	1	1	1	1	1
Plantation operations	1	1	1	1	1	1	1	1
Road/trail construction or maintenance (not related to forestry operations)	1	1	2	2	2	2	2	2
Walking trail construction or maintenance	1	1	2	2	2	2	2	2
Utility corridors	1	1	2	2	2	2	2	2
Fire management	1	1	2	2	2	2	2	2
Tourism/ recreation development/ management	1	1	2	2	2	2	2	2

The audit process assesses specific operational aspects to determine a performance rating against those specific standards identified each year and covers different aspects of forest planning and operations. Note: the number and nature of the standard questions within categories vary from year to year (reflecting changing priorities and management activities). For example:

- In 1996-97 153 Forest Practices Plans were audited using 13 categories which incorporated 127 standard questions.
- In 2001-02 169 Forest Practices Plans were audited using 15 categories which incorporated 124 standard questions.

- In 2003-04 133 Forest Practices Plans were audit using 11 categories which incorporated 144 standard questions.
- In 2005-06 103 Forest Practices Plans were audit using 11 categories which incorporated 139 standard questions.

Changes to the audit process in 2003 prevent a direct comparison with pre-2003 audit outcomes being made. Consequently, for this Indicator, an assessment of audit questions which cover management and operations which impact on soil and water values in forests are reported for two periods: 1996-97 to 2001-02 and 2003-04 to 2005-06.

In 1996-97 and 2001-02 a performance rating of 85 (out of a maximum rating of 100) was set by the Forest Practices Board (now the Authority) as the minimum required to meet the objectives of the *Forest Practices Act 1985*.

From 2003-04, a performance rating of 3.0 (out of maximum rating of 4.0) was set by the Forest Practices Authority as the minimal required to meet the objectives of the *Forest Practices Act 1985* and the *Forest Practices Code 2000*.

During the two reporting periods, on average, around 50 per cent of all standard audit questions audited were relevant (at different scales ranging from direct soil/water operations to more general) to soil and water values. Categories encompassing those standard questions which reflect amelioration practices during planning and operations are reported in Tables 4.1.b.5 and 4.1.b.6. Only a limited number of questions apply specifically to assessing the impact of forest operations on soil or water values and are reported in Table 4.1.b.7.

Table 4.1.b.5 indicates that, on average, the performance standard was maintained (within statistically acceptable deviation) across all tenures during the reporting period.

**Table 4.1.b.5 Performance of discrete audit categories which impact on soil and water values 1996-97 to 2001-02**

Operation assessed	Total for all tenures		Private Industrial Forest		Private independent forest		State forest	
	1996-97	2001-02	1996-97	2001-02	1996-97	2001-02	1996-97	2001-02
Roading	88	97	90	98	72	94	91	98
Bridges	96	100	100	100	100	-	91	100
Harvesting	86	99	88	100	75	100	90	99
Landings	82	96	83	97	76	87	81	97
Stream Reserve	93	95	96	97	88	83	93	96
Site Preparation	87	92	88	94	100	85	82	91
Average	89	97	91	98	85	90	88	97

Table 4.1.b.6 indicates that the performance standard, on average, across all operations was maintained for all tenures except private independent forest owners. The low number of audits carried out on this land tenure means that one or two operations with poor performance could bias the overall result.

**Table 4.1.b.6 Performance of discrete audit categories which impact on soil and water values 2003-04 to 2005-06**

Operation assessed	Total for all tenures		Private industrial forest		Private independent forest		State forest	
	2003-04	2005-06	2003-04	2005-06	2003-04	2005-06	2003-04	2005-06
Roading	3.8	3.6	3.8	3.5	3.9	3	3.7	3.7
Harvesting	3.9	3.7	3.9	3.8	3.9	3.4	3.8	3.7
Soils and Water	3.8	3.7	3.8	3.8	3.9	3.5	3.8	3.7
Average	3.8	3.7	3.8	3.7	3.9	3.3	3.8	3.7

Table 4.1.b.7 provides details on the performance rating achieved for each specific question relating to soil and water values. No audit question applied specifically to the

monitoring or measurement of water quantity, which reflects the impracticality of direct measurement of water yield.

## References

- Brown, G. and Laffan, M. 1993. *Forest Soil Conservation Manual*. Forestry Commission, Hobart Tasmania.
- Bunce, S.E.H., McIntosh, P.D., Davies, P. and Cook, L.S.J. 2001. Effects of pre-Code forest clearfelling on the geomorphology and sedimentology of headwater streams in upland granite terrain, Tasmania. Proceedings of the Third Australian Stream Management Conference, 27-29 August, 2001, Brisbane, Queensland, pages 87-93. CRC for Catchment Hydrology, Melbourne.
- Davies, P.E., McIntosh, P.D., Wapstra, M., Bunce, S.E.H., Cook, L.S.J., French, B. and Munks, S. 2005. Changes to headwater stream morphology, habitats and riparian vegetation recorded fifteen years after pre-Forest Practices Code forest clearfelling in upland granite terrain, Tasmania, Australia. *Forest Ecology and Management* 217: 331–350
- Department of Primary Industries, Water and Environment 1999. *Quarry Code of Practice*. Department of Infrastructure, Energy and Resources Environment Protection, Planning and Analytical Services Division, Hobart
- Forest Practices Board (2000). *Forest Practices Code*, Forest Practices Board, Hobart, Tasmania
- Grant, J.C., Laffan, M.D., Hill, R.B. and Neilson, W.A. 1995. *Forest Soils of Tasmania. A Handbook for identification and management*. Forestry Tasmania, Hobart
- Laffan, M.D., Jordan, G. and Duhig, N. 2001. Impacts on soils from cable logging steep slopes in northeastern Tasmania, Australia. *Forest Ecology and Management* 144: 91–99
- Harwood, C.E. and Jackson, W.D. 1975. Atmospheric losses of four plant nutrients during a forest fire. *Australian Journal of Forestry* 38: 92-99
- Laffan, M., Grant, J. and Hill, R. 1996. A method for assessing the erodibility of Tasmanian forest soils. *Australian Journal of Soil and Water Conservation* 9(4): 16 - 22
- Lovett, S. and Price, P. (eds.) 1999. *Riparian Land Management Technical Guidelines* Land and Water Resources Research and Development Corporation, Canberra.

- Munks, S. (Ed.) (1996). *A Guide to Riparian Vegetation and its Management*.  
Department of Primary Industry and Fisheries, Tasmania
- Pennington, P., Laffan, M., Lewis, R. and Otahal, P. 2001. Assessing the long-term impacts of forest harvesting and high intensity broadcast burning on soil properties at Warra LTER site. *Tasforests*: 291-301
- Pilgrim, D.H. 1993. *Estimation of Peak Flows for Small to Medium Sized Rural Catchments in Australian Rainfall and Runoff, A Guide to Flood Estimation, Volume 1*. The Institute of Engineers, Australia

**Table 4.1.b.7 Performance rating by tenure for specific audit questions assessing the impact of forest operations on soil or water values**

<b>Value</b>	<b>Year</b>	<b>No. specific questions relating to value</b>	<b>No coupes assessed per question</b>	<b>Percentage of the total number of coupes assessed per question</b>	<b>Performance Rating - Private industrial forest</b>	<b>Performance Rating - Private independent forest</b>	<b>Performance Rating - State forests</b>	<b>Average Performance Rating for all tenures</b>
Soil Erosion	1996-07	7	63	41%	92	97	88	93
	2001-02	5	64	38%	89	93	92	91
	2003-04	3	112	84%	3.8	3.8	3.8	3.8
	2005-06	3	66	64%	3.9	3.7	3.7	3.7
Soil Property	1996-07	3	73	48%	34	32	35	34
	2001-02	0	-	-	-	-	-	-
	2003-04	1	53	40%	4.0	4.0	3.8	3.9
	2005-06	1	48	47%	3.9	3.5	3.8	3.8
Water Quality	1996-07	6	85	56%	95	98	86	93
	2001-02	2	107	63%	98	91	99	96
	2003-04	1	101	76%	3.9	4.0	3.8	3.9
	2005-06	1	42	41%	3.8	3.2	3.9	3.8

## **CRITERION 5: MAINTENANCE OF FOREST CONTRIBUTIONS TO GLOBAL CARBON CYCLES**

Estimates of total forest biomass allow temporal changes in the total carbon pool to be identified. The typing of forest helps pinpoint where changes are occurring. The data provided below for Tasmania is expected to continue to improve in accuracy as methods of estimating forest biomass continue to be refined.

### **INDICATOR 5.1.a TOTAL FOREST ECOSYSTEM BIOMASS AND CARBON POOL**

Forests are large natural pools of carbon; estimates of their biomass are a measure of their contribution to global carbon cycles.

The National Carbon Accounting System (NCAS) was developed by the Australian Greenhouse Office for national reporting of carbon emissions and sinks for land-based (largely forestry and agricultural) activities. The data covers native woody vegetation only since this is the focus of the Kyoto Protocol, which NCAS was established to support.

The NCAS provided interim estimates of total forest biomass in 2001 for the 2002 Sustainability Indicators Report, based on the biomass at maturity (i.e. in mature condition). These data have been updated and the time-series extended to 2005. Revised data for 2001 and data for 2005 are presented in Table 5.1.a. The estimates are spatially interpolated using relationships between site productivity mapping and data on plots where there has been no known recent disturbance (Richards and Brack 2004). These data are calculated as follows:

- Area and type of forest: forest extent from the Landsat satellite forest extent mapping by the Australian Greenhouse Office (Caccetta *et al.* 2003) and the Major Vegetation Group classes of the National Vegetation Information System (NVIS) (Table 5.1.a)
- Point-based estimates of above-ground forest biomass at maturity from a collation of data (published and unpublished) by CSIRO Forestry and Forest Products for the NCAS (Raison *et al.* 2003).
- “Productivity” surface (used to interpolate biomass from point-based estimates) as reported in Kesteven and Landsberg (2004). A relationship was derived between the measured aboveground biomass at maturity of a site and its long-term “Productivity Index”.
- The relationship between mass and productivity was applied to the forest types as mapped in the NVIS (Richards and Brack 2004).
- Conversions to total biomass (including roots) from above-ground biomass were calculated from conversions by Snowdon *et al.* (2001) (NCAS Technical Report No. 18).

Based on the above, the estimated biomass of Tasmanian forests by type is summarised in Table 5.1.a. Estimates are quoted in millions of tonnes, reflecting the imprecision of contemporary calculation methods and data sources. The values derived are over-estimates,

as they assume all forests are mature, and therefore do not take account of such disturbances as harvests or fires, which would reduce the biomass at maturity. Furthermore, the data are derived at a national level, and their applicability to Tasmanian forests is untested.

**Table 5.1.a Estimated native forest biomass in Tasmania by vegetation type**

Major Vegetation Group (from NVIS)	Mean Above-ground Biomass (t/ha)	Standard Deviation	Area ('000 hectares) 2001	Area ('000 hectares) 2005	Total Above-ground Biomass (millions of tonnes) 2001	Total above-ground biomass (millions of tonnes) 2005	Total biomass (millions of tonnes) 2001	Total biomass (millions of tonnes) 2005
Rainforest and Vine Thickets	205	59	701	709	144	145	157	159
Eucalyptus Tall Open Forest	194	67	695	699	135	136	151	152
Eucalyptus Open Forest	147	60	1,705	1,714	251	253	302	304
Eucalyptus Low Open Forest	152	26	13	13	2	2	4	4
Eucalyptus Woodland	127	45	491	498	62	63	81	82
Acacia Forest and Woodland	238	65	12	12	3	3	3	3
Callitris Forest and Woodland	119	17	0	0	0	0	-	-
Casuarina Forest and Woodland	131	21	9	11	1	1	2	2
Other Forests and Woodlands	177	54	31	32	6	6	7	8
Eucalyptus Open Woodland	105	32	75	75	8	8	10	10
Low Closed Forest and Closed Shrubland	178	50	201	209	36	37	49	51
Other	123	27	704	762	106	114	-	-
<b>Total</b>			<b>4,636</b>	<b>4,734</b>	<b>753</b>	<b>768</b>	<b>766</b>	<b>774</b>

Source: Australian Greenhouse Office, 2005

The NCAS operates in time-series and all methodological changes are reflected in updates to the entire time-series. Therefore there is comparability in estimates over time, and hence change can be assessed. In Table 5.1.a the difference in the 2001 figures compared

to those reported in the 2002 Sustainability Indicators Report reflect changed methodologies. The differences in total biomass between 2001 and 2005 are minor and not significant.

### References

- Cacetta, P.A., Bryant, G., Campbell, N.A., Chia, J., Furby, S., Kiiven, H.J, Richards, G.R., Wallace, J. and Wu, X. 2003. Notes on Mapping and Monitoring Forest Change in Australia Using Remote Sensing and Other Data. 30th International Symposium of Remote Sensing and the Environment, Hawaii, October 2003.
- Commonwealth of Australia and State of Tasmania 2002. *Sustainability Indicators for Tasmanian Forests 1996-2001*. In Background Report. Inquiry on the progress with Implementation of the Tasmanian Regional Forest Agreement (1997). Resource Planning and Development Commission 2002.
- Kesteven, J., Landsberg, J. and URS Australia 2004. Developing a National Forest Productivity Model, National Carbon Accounting System Technical Report No. 23, Australian Greenhouse Office, Canberra
- Raison, J., Keith, H., Barrett, D., Burrows, B. and Grierson, P. 2003. Spatial estimates of biomass in “mature” native vegetation. National Carbon Accounting System, Technical Report No. 44, Australian Greenhouse Office.
- Richards, G.P. and Brack, C. 2004. A Continental Biomass Stock and Stock Change Estimation Approach for Australia. *Australian Forestry* 67(4): 284-288.
- Snowdon, P., Eamus, D., Gibbons, P., Khanna, V., Keith, H., Raison, J. and Kirschbaum, M. (2000) *Synthesis of allometrics, review of root biomass and design of future woody biomass sampling strategy* National Carbon Accounting System Technical Report No. 17, Australian Greenhouse Office, Canberra.

## **CRITERION 6: MAINTENANCE AND ENHANCEMENT OF LONG-TERM MULTIPLE SOCIO-ECONOMIC BENEFITS TO MEET THE NEEDS OF SOCIETY**

This criterion monitors and reports across five sub-criteria relevant to how the forest sector provides multiple socio-economic benefits to society. Areas covered include the production and consumption of forest products, investment in the forest sector, recreation and tourism, the cultural, social and spiritual values provided by forests and forest-related employment and community needs.

### **6.1: Production and consumption**

This sub-criterion monitors socio-economic benefits by ascertaining by reporting trends in the value and quantities of both timber and non-wood products. The benefits include benefits to regional economies and recycling.

#### **INDICATOR 6.1.a VALUE AND VOLUME OF WOOD AND WOOD PRODUCTS**

This indicator enables socio-economic benefits to be monitored by ascertaining trends in value and volume of wood production.

The Tasmanian RFA seeks to provide for growth in the development of industries associated with the sustainable use of forest products and contains a number of initiatives in Attachment 12 designed to facilitate value-adding of wood harvested from native forest and plantations.

In the 2002 Sustainability Indicators Report, the Australian Bureau of Statistics (ABS) published data were used to provide information on the volume and value of wood and wood products. The last full financial year of data published by the ABS was 2002-03. Production and associated value figures are now collected as part of a five-yearly agriculture census in which forestry is aggregated with fishing and agriculture.

Indicator 2.1.c provides further data on the production of wood from native forests and plantations, though not its financial value.

#### **Volume**

The 2002 Sustainability Indicators Report identified that there had been a fluctuation in the annual volume of logs harvested from native forest and softwood plantations over the previous decade. However, there was no evidence of any long-term decline or increase in production. The volume of sawn, peeled or sliced timber produced had varied, and that the trend was toward a gradual increase in volumes, particularly in softwood plantation material.

Table 6.1.a.1 presents the available ABS data up to 2002-03. The 2000-01 row is the final period reported in the 2002 Sustainability Indicators Report.

**Table 6.1.a.1 Volume of logs processed and timber produced in Tasmania ('000m<sup>3</sup>)**

Year	Eucalypt Sawlogs	Other Native Sawlogs	Plantation Softwood Sawlogs	Total Sawlogs Delivered	Total Sawn, Peeled and Sliced timber produced	Plantation Softwoods Peeled and Sliced timber produced
<b>2000-01</b>	468.5	27.4	369.9	865.8	338.6	174.1
<b>2001-02</b>	513.9	32.6	447.2	993.8	387.4	208.9
<b>2002-03</b>	525.0	28.4	509.8	1 063.2	398.5	228.0

Source ABS Catalogue Number 1303.6

Due to the inability to acquire the relevant ABS data for the complete period of this 2007 Sustainability Indicators Report, the wood production and volume data for this report has been sourced from Forestry Tasmania and Private Forests Tasmania annual reports. These reports provide comprehensive and accurate data on the harvest of wood from both plantations and native forests. Private Forests Tasmania reports data from all companies sourcing significant amounts of wood from private forests. Table 6.1.a.2 shows the reported volumes of wood harvested each year.

**Table 6.1.a.2 Quantity of wood produced from public and private forests in Tasmania ('000 tonnes)**

Wood production	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
<b>Hardwood – native forest sawlog, veneer and peeler</b>	678	686	778	869	804	707
<b>Hardwood – native forest pulpwood</b>	4,521	4,093	4,621	4,572	4,353	3,135
<b>Hardwood – plantation pulpwood</b>	266	547	749	654	918	1 063
<b>Softwood – plantation sawlog and veneer</b>	371	522	410	401	377	346
<b>Softwood – plantation pulpwood</b>	500	403	509	498	406	447
<b>TOTAL</b>	<b>6,336</b>	<b>6,251</b>	<b>7,067</b>	<b>6,994</b>	<b>6,858</b>	<b>5,698</b>

Source: Forestry Tasmania Annual Report 2005-06 and Private Forests Tasmania Annual Report 2005-06

NB. Sawlog volumes reported in cubic metres have been converted to tonnes in this table

Figure 6.1.a.1 shows there has been substantial variation in the annual production of wood over the last five years. The maximum volume of just over 7 million tonnes harvested in 2002-03 has decreased 19 per cent to 5.7 million in 2005-06, largely as a result of lower native forest pulpwood harvest.

**Figure 6.1.a.1 Total wood production on public and private forests in Tasmania**

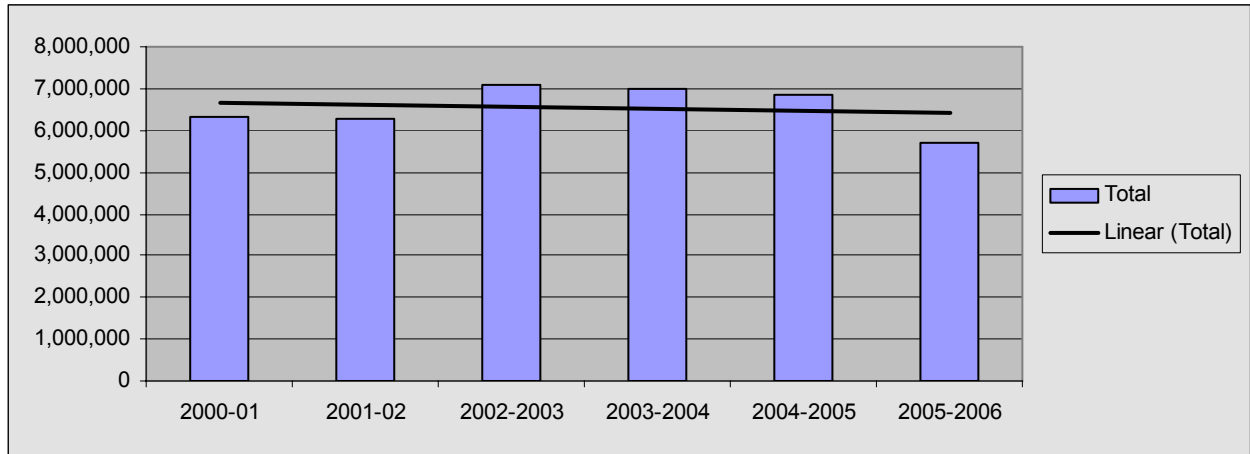
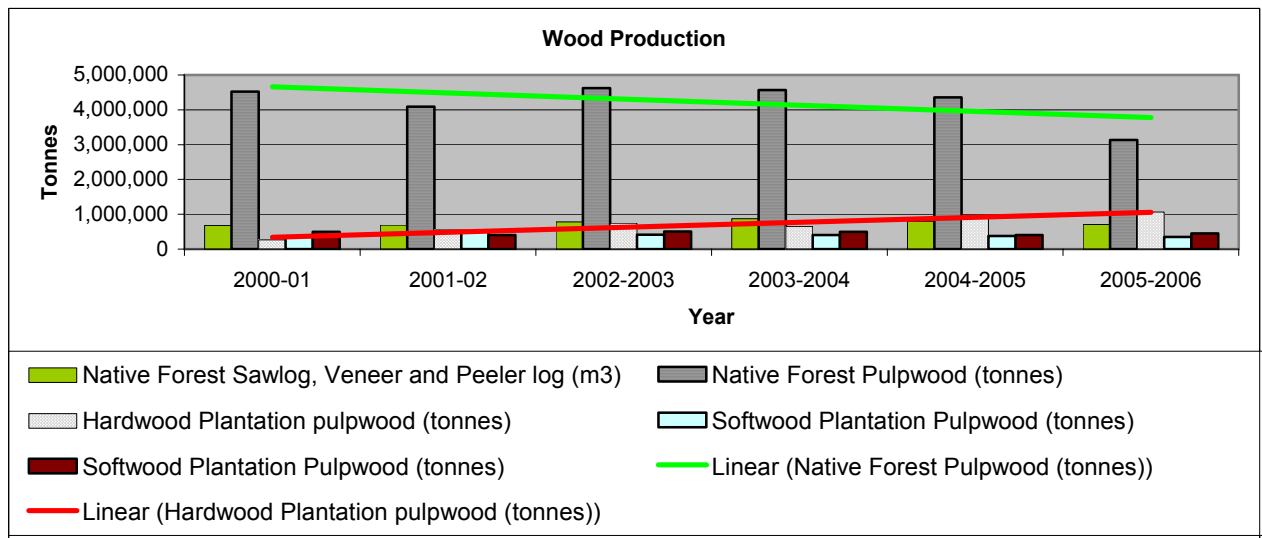


Table 6.1.a.2 and Figure 6.1.a.2 indicate that annual production of native forest sawlogs and pulpwood, hardwood plantation pulpwood, softwood sawlogs, and softwood pulpwood, have all varied considerably during the period. Of particular significance has been the 301 per cent increase in harvest of hardwood pulpwood from plantations from 265,000 tonnes in 2000-01 to 1,063,000 tonnes in 2005-06, and the 31 per cent decrease in the harvest of hardwood pulpwood from native forests from 4,520,703 tonnes in 2000-01 to 3,135,228 tonnes in 2005-06. This is largely a reflection of the pulp and paper industry’s increasing preference for the higher quality and higher yielding pulp derived from young plantation grown timber.

Fluctuations in native forest hardwood sawlog production are largely the result of fluctuations in demand in downstream industries such as building construction.

**Figure: 6.1.a.2 Wood production on Tasmanian public and private forests by product type**



As reported in the 2002 Sustainability Indicators Report, meaningful data on other minor wood products such as firewood, poles, fence posts, etc are not available.

## Value

The 2002 Sustainability Indicators Report included the ABS-published data on the value of production by forest industries for the sawmilling and wood and paper industry sectors up to the year 1999-2000. Data on other wood products (eg firewood, poles, fence posts, chopping blocks) were not available. It was reported that the turnover value of the forest industry in 1999-2000 was \$1,271.3 million. It was also reported that annual turnover value had steadily increased since the RFA by over \$100 million.

ABS manufacturing data on wood and wood products have not been published since 2000. As no other information is available, it is not possible to provide data on the value of wood and wood products in this report.

The ABS does publish data on the manufacturing industry in Australia (Catalogue Number 8221.0). Of the industries available for publication, the report indicates that Tasmania is the only State where Wood and Paper manufacturing ranks in the top three manufacturing industries for the state. The 2004-05 report also cites that the “wood and paper product manufacturing generates 24 per cent of manufacturing Industry value added (IVA) in Tasmania compared to seven per cent nationally” (p.32).

IVA represents the value added by an industry to the intermediate inputs used by the industry. IVA has replaced industry gross product (IGP) as the measure of the contribution by manufacturing industries to gross domestic product.

Table 6.1.a.3 indicates that the value of the Wood and Paper Manufacturing Industry in Tasmania has been increasing since 2000, however, 2004-05 shows a slight decrease in all except the ‘Sales and service income per person employed’ category.

**Table 6.1.a.3 Value of Tasmanian Wood and Paper Product Manufacturing Industry Subdivision (ANZSIC code 23)**

Year	Sales and service income (\$m)	Industry value added (\$m)	Sales and service income per person employed (\$'000)	Industry value added per person employed (\$'000)
2000-01	1,201.9	322.9	409.4	110.0
2001-02	1,044.7	506.1	np	np
2002-03	1,252.0	546.4	np	np
2003-04	1,218.0	583.0	296.9	142.2
2004-05	1,173.0	527.0	308.2	138.5

Source: ABS Publication 8221.0 Manufacturing Industry, Australia  
np= not published

Indicator 2.1.c provides further data on the production of wood from native forests and plantations.

It is expected that a current ‘Communities’ socio-economic research project being undertaken in Tasmania by the Cooperative Research Centre for Forestry in partnership with the Australian National University will be able to provide relevant data. Unfortunately this information will not be available until mid 2007.

## References

- Australian Bureau of Statistics 2000. *Manufacturing Industry, Tasmania, 1999-2000*, <http://www.abs.gov.au/>
- Commonwealth of Australia and State of Tasmania 2002. *Sustainability Indicators for Tasmanian Forests 1996-2001*, in *Background Report - Inquiry on the progress with Implementation of the Tasmanian Regional Forest Agreement (1997)*. Resource Planning and Development Commission, Hobart
- Forestry Tasmania 2006, *Annual Report 2005-06*, Forestry Tasmania, Hobart
- Private Forests Tasmania 2006, *Annual Report 2005-06*. Private Forests Tasmania, Hobart

## **INDICATOR 6.1.b VALUES, QUANTITIES AND USE OF NON-WOOD FOREST PRODUCTS**

This indicator enables socio-economic benefits to be monitored by ascertaining trends in quantities, values and usage of non-wood products against management objectives.

In the 2002 Sustainability Indicators Report, honey and beeswax were the only non-wood forest products for which data were available and reported. These data were sourced from Australian Bureau of Statistics (ABS) reports. The ABS has not collected data on honey or beeswax production since 2000. However, some further information on honey production has become available.

Since the 2002 Sustainability Indicators Report, information has become available on production of game, seeds, and tree ferns, although not all the data are forest related or comprehensive.

Sustainability Indicator 2.1.d provides further data on the sustainable production of non-wood forest products.

### **Honey and Beeswax**

Current production data are not readily available. The ABS has not reported honey and bee statistics since 2001. Honey data are no longer separately identified in ABS publications but included in aggregate livestock products.

In 2005 the Forests and Forest Industry Council (FFIC) released the report *Tasmanian Apiary Industry Profile*, a census of the Tasmanian apiary industry. The census was conducted, with the participation of the Tasmanian Beekeepers and Crop Pollinators Associations, as part of a wider review of issues facing the beekeeping industry in Tasmania with particular emphasis on leatherwood. The FFIC report contains information on the size of the industry, employment, access to floral resources on public and private land, pollination services, and leatherwood harvesting. This work also resulted in the publication of a floral database covering flowering sequences for the main species utilised.

The census of registered beekeepers, in particular semi-commercial and commercial beekeepers, was compiled through interview and survey processes. Much of the information on which the report is based was anecdotal. However, the FFIC report, covering the 2003-04 period, provides the most reliable and current data for the purpose of this indicator. The information following is sourced from the FFIC report unless otherwise stated.

The census sample size included approximately 80 per cent of registered hives from apiarists with greater than 20 hives, with intensive sampling of semi-commercial and commercial business units with larger registered hive numbers.

“The sampling can be viewed as 100 per cent of the major commercial operators, 92 per cent of hives from 200 plus hives and 84 per cent of hives from 100 plus hives. This is considered a very good sample of those beekeepers that are likely to gain 80 per cent or more of their total income from beekeeping” (FFIC 2005, p4).

Table 6.1.b.1 shows the number of licensed hives and apiary sites in 2003-04 on the major land tenures in Tasmania.

**Table 6.1.b.1 Apiary site tenure**

Operation Size	Land managed by Parks and Wildlife Service		State forest		Private land		Total	
	Hives	Sites	Hives	Sites	Hives	Sites	Hives	Sites
<b>≥1000</b>	4,334	43	4,665	80	10,888	161	19,887	284
<b>200-999</b>	740	22	3,155	98	4,864	139	8,759	259
<b>100-199</b>	30	1	613	18	1,122	38	1,765	57
<b>20-99</b>	na	na	121	7	119	7	240	14
<b>Total</b>	<b>5,104</b>	<b>66</b>	<b>8,554</b>	<b>203</b>	<b>16,993</b>	<b>345</b>	<b>30,651</b>	<b>614</b>

Source: FFIC 2005  
na = not available

Table 6.1.b.1 shows that the majority of hives are owned by the larger operators (more than 1000 hives). Hives are moved between forests and private land as apiarists pursue blossom seasons. Private land is used mainly for wintering sites, build up for pollination services and honey production. State forest managed by Forestry Tasmania and reserved land managed by the Parks and Wildlife Service are important for production by the large operators, with State forest being more important for small and medium sized operators.

Consistent with the 2002 Sustainability Indicators Report, data concerning honey and beeswax production are based on all honey sources, not just State forests.

In 1999-2000, 944 tonnes of honey and 13 tonnes of beeswax were produced providing a gross value of \$2.1 million (2002 Sustainability Indicators Report).

For the 2003-04 period, approximately 1,000 tonnes of honey was produced, with bulk prices varying between \$3,000 per tonne to \$5,000 per tonne.

Beeswax is produced at a ratio of 1 to 75 of honey and sold for an average \$3.50 per kilogram in the 2003-04 year.

For the 2003-04 year, there were 18,417 registered hives and 37 semi-commercial and commercial beekeepers with up to 10 major commercial operations including five businesses with more than 1,000 hives.

“Many beekeepers are involved in crop pollination, both paid and incidental. While pollination services provide a small percentage of the industry’s cashflow they are an essential input to the expanding horticulture, seed and agricultural crops sectors.” (FFIC 2005).

While honey is the major product of the Tasmanian apiary industry other products include:

- Pollination services which are critical to agriculture and horticulture;
- Live bees (in particular queens for breeding);

- Beeswax;
- Royal Jelly; and
- Propolis.

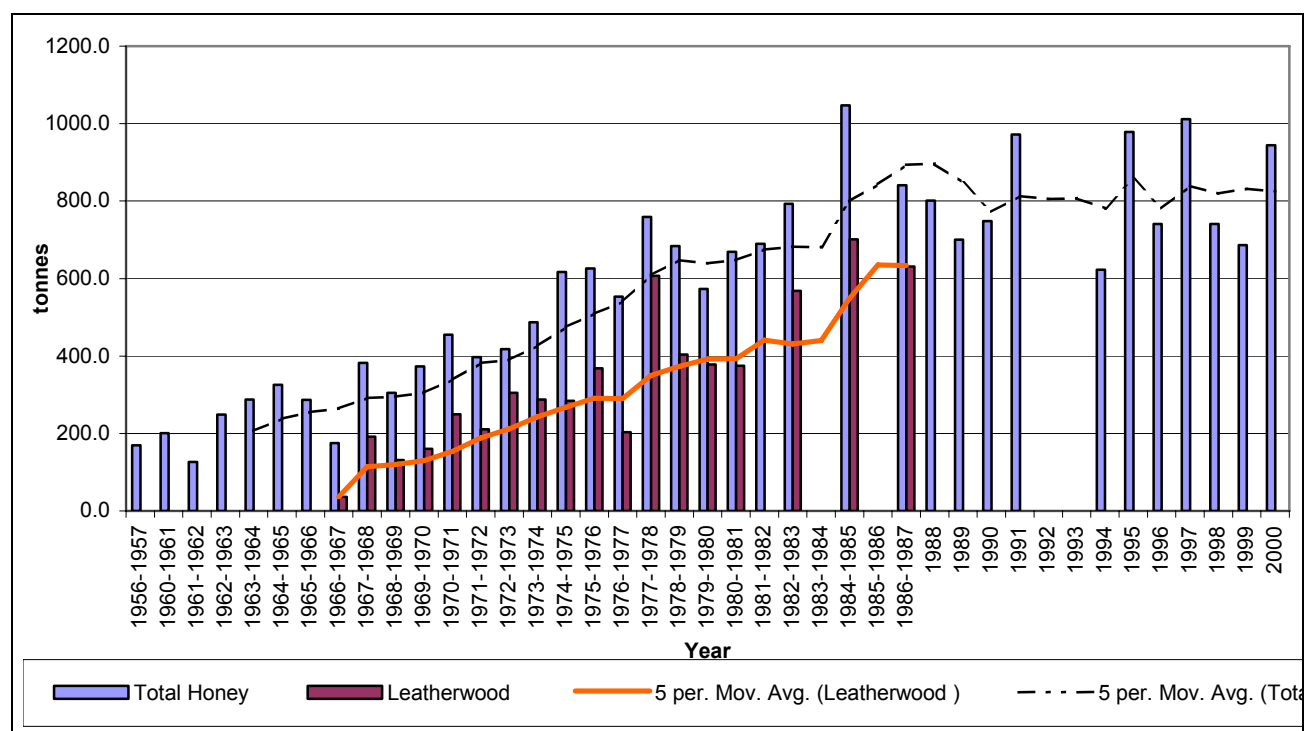
An emerging new product is honey produced from *Leptospermum scoparium*, more commonly known as Manuka honey, which is reputed to have healing properties.

The production volumes quoted for 2003-04 above were assembled by the Department of Primary Industries and Water to assess value of production and are regarded as approximate. Leatherwood honey production dominates the Tasmanian apiary industry in most but not all years, with leatherwood honey in the 2003-04 period accounting for approximately 70 per cent of all honey production. This has grown from the mid-1960s when it formed only 20 per cent of production by volume.

Figure 6.1.b.1 shows data provided by the FFIC on the production of all honey and leatherwood honey produced in Tasmania over the last 50 years. This information was collected from sources such as Tasmanian Year Books, the ABS, and the Department of Primary Industries and Water. Data are for more than five hives until 1975 and for more than 40 hives after 1975. A five year moving average has been plotted for the period 1956-2000.

Unfortunately, data collection for leatherwood honey ceased in 1987, and data for all honey ceased in 2000. While the data in Figure 6.1.b.1 is outside the reporting period, *Tasmanian Apiary Industry Profile* was released during the reporting period and shows useful long-term trends, which have relevance for the current reporting period.

**Figure 6.1.b.1 Honey production 1956-2000**



Source: FFIC (2005)

Figure 6.1.b.1 shows that:

- The annual production of all honey and leatherwood honey varies considerably. This is believed to be primarily due to climatic influences on nectar flow and productivity of hives.
- The average annual production of all honey and leatherwood honey increased steadily from the 1950s through to the mid 1980s, as shown by the five-year averages. This increase coincides with a steady expansion of the forest roading network during this period. This expansion provided access to many areas of previously inaccessible leatherwood-rich stands.
- From the late 1980s through to 2000, when data collection ceased for all honey, the peaks in annual production of honey remained steady. Without the benefit of ongoing data collection, the honey production trend during the 1987 to 2000 period indicates that production of all honey is likely to have remained steady during the current reporting period. This view is supported by data presented in Indicator 2.1.d which reports that the number of apiary sites and the number of hives on State forest land remained relatively constant during the current reporting period.

## Seed

Forestry Tasmania's Sustainable Forest Management Report for 2004-05 reports that 3,408 kilograms of seed was collected from State forest during that year. This was an increase on the previous year which saw 3,301 kilograms of seed harvested.

Anecdotal evidence provided by the Tasmania Seed Centre is that the collection of *Eucalyptus globulus* (a key plantation species) seed by commercial operators is concentrated on stands of trees identified as having important genetic characteristics for commercial silviculture. For example, *E. globulus* seed worth several hundred thousand dollars may have been harvested from Flinders Island (mainly on private property).

## Game

The only data on production of game from forests available for this indicator are confined to that collected by the Department of Primary Industries and Water on wallabies and possums processed by game meat works in Tasmania. Table 6.1.b.2 summarises this information. The system for shooting and tagging of game does not allow for location to be identified. No data are available on whether the animals were taken from forest or non-forest areas.

**Table 6.1.b.2 Game processed in Tasmania**

Year	Wallabies	Possums
2003-2004	8,784	373
2004-2005	20,630	583
2005-2006	19,045	839

Source: Department of Primary Industries and Water - Unpublished data

Until 2003 game meat processed through game meat works was recorded by weight. All meat processed from the game carcasses reported in Table 6.1.b.2 was used for human consumption.

During the three years reported on there was a significant increase in game meat harvested reflecting both market demand and the increased use of shooting as a means of browsing control in preference to poisoning.

### Tree Ferns

The only Tasmanian tree fern that can be harvested or traded is *Dicksonia antarctica* (manfern or soft tree fern). Two other tree fern species (*Cyathea cunninghamii* and *Cyathea marcescens*) are protected by the Tasmanian *Threatened Species Protection Act 1995*.

A management plan was developed in 2001 by the Tasmanian Government to facilitate the legal and sustainable harvest and export of tree ferns. The Tree Fern Management Plan provides guidelines for the harvesting of trunked tree ferns from native vegetation in Tasmania was established under the *Forest Practices Act 1985*.

All commercially harvested tree ferns on any land must be securely tagged with a tree fern tag obtained from the Forest Practices Authority at the point of harvest, and cannot be sold without a tag. Severe penalties apply for non-compliance with the regulations.

Table 6.1.b.3 below shows that the number of tree fern tags issued by the Forest Practices Authority since the implementation of the Tree Fern Management Plan in 2002.

**Table 6.1.b.3 Tree fern tags issued**

Year	Number of tree ferns tags issued	Tag cost (\$)	Value of tree fern tags issued (\$)
2002-2003	64,182	2.16	138,633
2003-2004	54,886	2.22	121,847
2004-2005	61,368	2.28	139,919
2005-2006	45,131	2.34	105,607

Source: Forest Practices Authority Annual Report (2003-2006)

Numbers of tags issued have been relatively constant in most years with fluctuations due to changes in market demand.

No information is available on the value of tree ferns in the retail market.

## References

- Forest Practices Authority 2001. *Tree Fern Management Plan for the Harvesting, Transporting, or Trading of Dicksonia antarctica in Tasmania*, Forest Practices Authority, Hobart
- Forest Practices Authority, Annual Reports, Hobart,  
<http://www.fpa.tas.gov.au/index.php?id=81>
- Forestry Tasmania 2006. *Sustainable forest management report 2004-2005*, Forestry Tasmania, Hobart
- Forests and Forest Industry Council 2005. *Tasmanian Apiary Industry Profile*, Forests and Forest Industry Council, Hobart

## INDICATOR 6.1.c VALUE OF FOREST BASED SERVICES

Forest based services, as opposed to forest based products, have long been recognised by society as having value. To date, such services have not had a readily quantifiable market value or attracted financial payments in Tasmania.

Marketed forest-based services such as credits for carbon, salinity, ecosystem services and ecotourism provide realised economic values including government revenues for public services, livelihoods, profits to businesses and incomes for landowners. Although their contribution to the national economy can be relatively small, compared with wood products, they are growing in economic importance. They may also provide significant benefits in reversing broader environmental degradation.

Tasmania did not report against this new indicator in 2002 however, an emerging market for some forest-based services such as credits for carbon, salinity, ecosystem services and wilderness tourism which can generate revenues will become more quantifiable and reportable in the future.

For markets to operate, the service to be marketed needs to be able to be defined and a right to that service created. Currently carbon rights can be defined and are recognised under the *Forestry Rights Registration Act 1990*.

Within Tasmania there are no current markets for carbon trading, other than options for carbon contained in various joint venture plantation investments and management investment schemes. There are no markets for salinity credits. There is some recognition in some natural resource management (NRM) related projects of ecosystem services. This recognition is limited to providing funding to projects that are deemed to have the greatest potential to enhance ecosystem services.

Forest-based recreation and tourism services are included in this indicator. There is no current estimate of the economic value resulting from recreational and tourism use of reserves managed under the *National Parks and Reserves Management Act 2002*. The most recent data are from a study conducted by the Centre for Regional Economic Analysis (CREA) at the University of Tasmania in 1998-99. Estimates were made of both the direct contributions in terms of tourism expenditure incurred while visiting Parks and Wildlife Service (PWS) sites as well as the overall contribution to the state economy. The study was based on a survey of nine sites, of which all but one were in forested areas.

It was estimated that there was direct expenditure of between \$122 million and \$141 million in 1998-99. Of this amount, expenditure by mainland visitors contributed to more than 75 per cent, overseas visitors accounted for between 13 to 14 per cent, and local Tasmanian visitors accounted for only nine per cent. At the time local residents accounted for over 43 per cent of the total visits to reserves managed by the PWS, their share in expenditure was substantially less because of the much lower average expenditure incurred by local residents in visiting these areas.

It was estimated that this expenditure translated to between \$105 million to \$126 million in gross state product (at factor cost) in Tasmania.

The employment effects were estimated to be even larger because reserve tourism expenditures are concentrated in industries with a high proportion of part-time workers. Tourism associated with visits to the PWS managed reserves was estimated to contribute approximately 3,550 to 4,200 positions. The major beneficiary industries were wholesale and retail trade, restaurants and hotels, and entertainment and recreation. The tourism region which benefited the most in terms of extra regional output was the East Coast of Tasmania.

The value of recreation and tourism in reserves would have increased considerably since the 1998-99 study, at a minimum due to the increase in overall visitors to the state. Between 1999 and 2006 the number of visitors to eight highly used reference sites in reserves (all forested) increased by 15 per cent.

For future studies in Tasmania recent work undertaken in Western Australia to estimate the value of tourism related to natural areas (Carlsen and Wood 2006) may provide some guidance.

### **References**

Carlsen, J. and Wood, D. 2006. Assessment of the Economic Tourism in Western Australia's Parks and Forests Sustainable Tourism CRC

Centre for Regional Economic Analysis 2000. The Contributions of the Parks and Wildlife Service's Estate to the Tasmanian Economy in 1998/99, Final Report to Department of Primary Industries, Water and Environment, Hobart

World Tourism Organisation

[http://www.maltatourismauthority.com/uploads/1675/WTO\\_definition\\_of\\_tourism.pdf](http://www.maltatourismauthority.com/uploads/1675/WTO_definition_of_tourism.pdf)  
(accessed August 2006)

## **INDICATOR 6.1.d PRODUCTION AND CONSUMPTION AND IMPORT/EXPORT OF WOOD, WOOD PRODUCTS AND NON-WOOD PRODUCTS**

This indicator is intended to measure the trends in the consumption of wood, wood products and non-wood products in Tasmania, and the sources of supply. It also attempts to illustrate the ability of Australian forest and timber industries to meet society's demand for forest-based products, and the demand pressures faced by Australia's forest resources.

This indicator is relevant at the national level rather than the State level. Limited data are available at the State level on import, export and domestic consumption of wood and wood products, therefore consumption figures cannot be reported. Internal trade figures between jurisdictions are not reported. The limited data available are summarized below.

This indicator was not reported in the 2002 Sustainability Indicators Report.

### **Wood products exported from Tasmania**

Table 6.1.d.1 provides data on the export of wood products from Tasmania obtained from the Australian Bureau of Agricultural Research Economics (ABARE). However, these are only those exports that leave directly from Tasmanian ports to overseas markets. Forest products that are exported via mainland ports as part of larger orders or following secondary processing are not recorded as Tasmanian in origin. They are recorded for the State where the port from which the products leave the country is located.

Woodchips and lower valued products are the dominant product exported from Tasmania in terms of value (74 per cent) and volume; predominately to Asian economies.

Until April 2005 there were confidentiality restrictions applied by the Australian Bureau of Statistics on the release of woodchip export data. Due to this restriction the only full financial year with complete volume and value data in Table 6.1.d.1 for woodchips exported, is the 2005-06 period.

The second most important wood product exported in 2005-06 was medium density fibreboard (MDF). MDF exports in the review period increased steadily as production at the Bell Bay plant steadily improved. However, a fire in 2006 destroyed Tasmania's only MDF plant and a decision was made by the owners to close the plant.

Exports of writing and printing papers have remained steady over the last three years.

**Table 6.1.d.1 Wood products exported from Tasmania**

<b>Product</b>		<b>2001-02</b>	<b>2002-03</b>	<b>2003-04</b>	<b>2004-05</b>	<b>2005-06</b>
<b>Roundwood</b>	Quantity (m <sup>3</sup> )	413,344	366,661	354,770	258,907	256,802
	Value (\$)	32,214,759	27,033,344	25,502,037	20,751,562	18,433,618
<b>Sawnwood</b>	Quantity (m <sup>3</sup> )	21,038	12,419	10,753	9,418	12,487
	Value (\$)	15,644,486	10,071,408	9,895,815	8,533,408	11,078,769
<b>Woodchips</b>	Quantity (tonnes)	np	np	np	np	2,127,498
	Value (\$)	np	np	np	np	336,880,647
<b>Veneers</b>	Quantity (m <sup>2</sup> )	3,380	3,733	5,949	2,264	1,752
	Value (\$)	2,088,444	2,531,375	4,178,986	1,991,207	1,487,410
<b>Particleboard</b>	Quantity (m <sup>3</sup> )	0	5,347	1,581	1,572	3,991
	Value (\$)	0	1,518,594	1,530,556	1,695,558	2,308,750
<b>Doors and Frames</b>	Quantity (number)	0	38		nr	
	Value (\$)	0	22,660		55,000	
<b>MDF</b>	Quantity (m <sup>3</sup> )	29,452	122,477	89,491	139,149	158,160
	Value (\$)	8,638,725	36,158,954	28,105,987	41,807,277	50,090,522
<b>Paper - Printing/writing</b>	Quantity (tonnes)	24,222	23,396	35,777	35,431	32,909
	Value (\$)	27,491,034	26,887,001	35,361,578	35,194,241	32,587,224

Source: ABARE (Data was sourced from the ABARE through both published and unpublished data. Where possible the ABARE publication "Australian Forest and Wood Products Statistics" (2006) was used)

np= not published

nr= not recorded

Most of Tasmania's export of roundwood is as eucalypt peeler logs to Asia. The data indicate that roundwood exports have been decreasing since 2002-03. This is due mostly to rising shipping costs and the conclusion of trial shipments to various countries to facilitate investment in new peeler plants within Tasmania.

Other products with significant export volumes and value are sawnwood and veneers.

### **Wood products imported to Tasmania**

The *Australian Forest and Wood Products Statistics* (ABARE 2006) data shown in Tables 6.1.d.2 and 6.1.d.3 indicate that the volume and value of wood and wood products imported into Tasmania is small in comparison to that exported. As for exports, data on imports into Tasmania through mainland ports are not included in import statistics for Tasmania but for the State where the product first entered Australia.

**Table 6.1.d.2 Volume of wood imports to Tasmania**

Type	Unit	2001-02	2002-03	2003-04	2004-05	2005-06
<b>Coniferous Sawnwood</b>	'000m <sup>3</sup>	0.2	0.1	0.0	0.1	0.1
<b>Broadleaved Sawnwood</b>	'000m <sup>3</sup>	0.0	0.0	0.0	0.0	0.0
<b>Plywood</b>	'000m <sup>3</sup>	0.1	0.1	0.1	0.0	0.1
<b>Particleboard</b>	'000m <sup>3</sup>	0.0	0.0	0.0	0.0	0.3
<b>Medium Density Fibreboard</b>	'000m <sup>3</sup>	0.0	0.0	0.0	0.0	0.0
<b>Pulp</b>	'000t	110.2	119.0	112.6	80.2	90.7

Source: ABARE (Data was sourced from the ABARE through both published and unpublished data. Where possible the ABARE publication "Australian Forest and Wood Products Statistics" (2006) was used)

**Table 6.1.d.3 Wood products imported to Tasmania**

Product	Unit	2001-02	2002-03	2003-04	2004-05	2005-06	
<b>Roughsawn sawnwood</b>	Volume	'000m <sup>3</sup>	0.1	0.0	0.0	0.1	0.2
	Value	\$'000	263	55	19	32	40
<b>Dressed Sawnwood</b>	Volume	'000m <sup>3</sup>	0	0.0	0.0	0.0	0.0
	Value	\$'000	19	17	24	0	0
<b>Veneers</b>	Volume	'000m <sup>3</sup>	0	0.0	0.1	0.0	0.0
	Value	\$'000	39	45	49	0	0
<b>All Board Products</b>	Volume	'000m <sup>3</sup>	0.2	0.0	0.1	0.0	0.4
	Value	\$'000	131	78	137	55	215

Source: ABARE (Data was sourced from the ABARE through both published and unpublished data. Where possible the ABARE publication "Australian Forest and Wood Products Statistics" (2006) was used)

Where the volume figure in Table 6.1.d.3 is zero, the true volume may not be zero, but is less than the 1,000 cubic metres required for the purpose of the data.

### **Non-wood Products**

Limited data are available on import/export of non-wood forest products.

#### **Dicksonia antarctica (manfern or soft tree fern)**

All tree fern exports require an export permit from the Australian Government Department of the Environment and Water Resources (DEW) (formerly the Department of the Environment and Heritage). When the DEW issues an export permit they record basic details of the exporter, number of ferns, the Forest Practices Plan number, and the tag number. Table 6.1.d.4 provides information on the number of tags issued by the Forest Practices Authority and the number of ferns exported since 2002.

**Table 6.1.d.4 Tasmanian tree fern exports**

Financial Year	Tree fern tags Issued	Tree fern exports	Percentage exported
2002-03	55 671	14 147	25 %
2003-04	56 673	16 249	29 %
2004-05	61 368	36 771	60 %
2005-06	45 131	20 743	46 %

Source: Australian Department of the Environment and Water Resources - unpublished data "

Most tree ferns harvested in Tasmania are transported to Victoria before export overseas. The Australian Quarantine Inspection Service in Hobart advises that approximately 4,800 tree fern stems are exported through Tasmanian ports each year.

Table 6.1.d.5 shows the major destinations for tree ferns exported from Tasmania.

**Table 6.1.d.5 Tree fern export destinations**

Destination	2002-03	2003-04	2004-05	2005-06
Canada	350	0	0	0
France	290	0	0	0
Ireland	0	0	1 641	0
Italy	0	293	0	358
Japan	10	0	282	0
Netherlands	348	727	1 066	304
Singapore	0	27	19	0
United Kingdom	13 149	15 193	33 763	19 336
United States	0	9	0	745

Source: Australian Department of the Environment and Water Resources - unpublished data

Over the last four years, the United Kingdom has held a 93 per cent total share of the tree fern export market.

## Game Meat

The only exports of game meat that are regulated by the DEW are possums and wallabies. The commercial export of these species occurs only if there is a wildlife trade management plan approved under the *Environment Protection and Biodiversity Conservation Act 1999*.

**Table 6.1.d.6 Possum export destinations (no unit shown for number)**

Destination	2002		2003		2004		2005	
	Quantity	Product	Quantity	Product	Quantity	Product	Quantity	Product
Japan							1	body mount skins
United States of America	1395 kg	meat	3 flasks	Cell line			6	skins
New Zealand	213 kg	fur			2000	skins	2900	skins
Germany					220 kg	furs	30 Kg	furs
China					1	carcass	2	carcass
Italy			3000	skins			12	tissues
Taiwan							27	skins
Vietnam					1998	skins		
Hong Kong	11,631kg	meat			500 kg	carcass		
France					301 kg	carcass		
					80 kg	carcass		

*Source: Australian Department of the Environment and Water Resources - unpublished data*

The DEW provided the data in Table 6.1.d.6 on the export destinations and product type for possums exported from Tasmania. New Zealand is consistently the major purchaser of possum skins and furs across the reporting period, while destinations for meat and carcass products vary.

In Tasmania, the only Wildlife Trade Management Plans currently in place are for Flinders and King Islands. These were approved by the Australian Government in November 2005. To November 2006, only 154 Bennetts wallaby skins have been exported under these plans. Of these 154 skins, four went to the United States of America, 100 went to Italy, and 50 went to Hong Kong.

### ***Tree Seed***

High demand for seed for use within Tasmania limits the ability to export major quantities of seed. The Forestry Tasmania Seed Centre anecdotally reports that in 2004-05 a mixture of Eucalyptus, Acacia and other minor species seeds to the value of \$4351 was sold to overseas purchasers.

The 2004-05 Sustainable Management report produced by Forestry Tasmania indicated that 3,408 kilograms of seed was collected from State forest in the year 2004-05.

## **References**

Australian Bureau of Agricultural Research Economics 2006. *Australian Forest and Wood Products Statistics, September and December Quarters 2005*. Canberra.

Commonwealth of Australia and State of Tasmania 2002. *Sustainability Indicators for Tasmanian Forests 1996-2001*, in *Background Report - Inquiry on the progress with Implementation of the Tasmanian Regional Forest Agreement (1997)*. Resource Planning and Development Commission, Hobart

Forestry Tasmania 2005. Sustainable Forest Management Report 2004-05. Forestry Tasmania. <http://www.forestrytas.com.au/forestrytas/pages/publications.html>

## INDICATOR 6.1.e DEGREE OF RECYCLING OF FOREST PRODUCTS

This indicator provides information on the extent to which recycling or reuse of forest products occurs in Tasmania. Recycling of forest products can, in the broad sense, be linked to the conservation of forest resources by reducing the overall demand for new raw materials direct from the forest.

Data on recycled and/or consumed forest products are available only in a generalised form and is limited in extent. It is known that white office paper, newsprint, cardboard and liquid paperboard are all recycled within Tasmania although data on actual quantities consumed and recycled are limited. For example, Australian Bureau of Statistics figures indicate that in 2003, 83 per cent of Tasmanian households were recycling 'paper and cardboard'.

For specific types of paper products, data collected from a few national sources and studies are presented on a calendar year basis in Table 6.1.e. Newsprint data were obtained from the *Newspaper Recycling Statistics (2002-2005)*. The data for 'printing and writing' and 'packaging and industrial' products are indicative only, as data are derived from the one off *National Packaging Covenant Gap Analysis Report (2005)* and divided by State on a pro rata population basis. It should be noted that definitions of 'paper', 'recycling' and 'waste' vary between data collectors.

**Table 6.1.e Tasmanian consumption and recycling of forest products (tonnes)**

Product	2002	2003	2004	2005
<b>Newsprint</b>				
• Consumed	10801	11415	12865	12187
• Recycled	7817	7392	8295	8070
• Proportion (%)	72.4	64.8	64.5	66.2
<b>Printing and writing</b>				
• Consumed	N/A	32137	N/A	N/A
• Recycled	N/A	4882	N/A	N/A
• Proportion (%)	N/A	15.2	N/A	N/A
<b>Packaging and industrial</b>				
• Consumed	N/A	40503	N/A	N/A
• Recycled	N/A	33755	N/A	N/A
• Proportion (%)	N/A	83.3	N/A	N/A

There is a reasonable rate of recovery of timber products occurring as well, with tip shops and salvage shops offering old timber furniture and items for reuse (including items recovered from demolitions or renovations).

The Environment Division of the Department of Tourism, Arts and the Environment manages a Waste Exchange database which allows the exchange and re-use of timber and paper products, amongst other products, which are surplus to needs for a 'waste producer'

and a useful product for a 'consumer'. This database has the potential to collect recycling data but does not currently do so.

### **References**

ANZECC Industry Waste Reduction Agreement Newsprint 2001-2005 – Report on Year 1, to December 31 2001. Norske Skog Australasia and Publishers National Environment Bureau

ANZECC Industry Waste Reduction Agreement Newsprint 2001-2005 – Report on Year 2, to December 31 2002, Norske Skog Australasia and Publishers National Environment Bureau

ANZECC Industry Waste Reduction Agreement Newsprint 2001-2005 – Mid-Term Review and Report on Year 3, to December 31 2003. Norske Skog Australasia and Publishers National Environment Bureau

ANZECC Industry Waste Reduction Agreement Newsprint 2001-2005 – Report on Year 4, to December 31 2004. Norske Skog Australasia and Publishers National Environment Bureau

Newspaper Recycling Statistics 2005. Publishers National Environment Bureau

Final Report on National Packaging Covenant Gap Analysis, February 2005. Martin Stewardship & Management Strategies Pty Ltd and New Resource Solutions Pty Ltd

## 6.2: Investment in the forest sector

This sub-criterion reports on the investment and expenditure in forest management, extension and the development and implementation of new technologies.

### **INDICATOR 6.2.a INVESTMENT AND EXPENDITURE IN FOREST MANAGEMENT**

This indicator aims to monitor the investment in managing all forests and plantations, and the expenditure on developing, maintaining, and obtaining goods and services from them. This indicator was part of Research Indicator 6.3.a in the 2002 Sustainability Indicators Report.

A number of government bodies, publicly listed companies, private companies, associations and individuals have, wholly or as part of other activities, invested in forest management in Tasmania during the last five years. However, comprehensive data on the level of this investment across organisations is not readily available.

These investments include those in:

- establishing new plantations;
- managing native forests and plantations for commercial and non-commercial uses, including wood and non-wood products;
- maintenance of biodiversity;
- water quality and production;
- recreation and tourism;
- constructing and maintaining infrastructure such as roads, walking tracks and fire breaks;
- protecting and conserving forests;
- education and training for people involved in forest management and involving the community in forest management, such as through consultation processes and the provision of information; and
- establishing processing facilities for both wood and non-wood forest products.

As required by either State or Commonwealth legislation, incorporated bodies are required to report annually, either to Parliament in the case of government entities or to shareholders for incorporated bodies. Unfortunately, such public reporting requirements must adhere to accounting standards and as such do not clearly identify investment and expenditure solely attributable to forest management.

The major public and private forest organisations that undertake investment in and expend monies in forest management within Tasmania are listed alphabetically in Table 6.2.a.1. All of these companies are accountable for their expenditure and report annually to either Parliament (public sector) or their shareholders (private sector).

**Table 6.2.a.1 Major organisations investing in forest management in Tasmania**

Department of Primary Industries and Water	Tasmanian government agency - monitoring and research into natural forest values including land, biodiversity and water.
FEA Pty Ltd	Tasmanian based company listed on Australian Stock Exchange - owns native forest, plantation and wood processing facilities.
Forest Practices Authority	Tasmanian statutory authority – forest practices regulator
Forestry Tasmania	Tasmanian government owned business – manages native forest and plantations, recreation and tourism facilities, construction of roads and infrastructure, and carries out forest research and analysis.
Great Southern Plantations Pty Ltd	Australian company listed on Australian Stock Exchange. Company establishes and manages plantations within Tasmania.
Gunns Ltd	Tasmanian based company listed on Australian Stock Exchange - owns native forest, plantation and wood processing plants.
Hydro Tasmania	Tasmanian government owned business - use of water resources to produce power.
Parks and Wildlife Service	Part of the Department of Tourism, Arts and the Environment - responsible for the management of large areas of forested reserved lands for conservation and recreation.
Norske Skog	International company owns native forest, plantation and wood processing plants.
Private Forests Tasmania	Tasmanian statutory authority – supports private forest sector.
Taswood Growers/Rayonier	Own and manage pine plantations
Tourism Tasmania	Tasmanian statutory authority – promotes tourism within Tasmania including tourism in forested areas.

The Parks and Wildlife Service has made a considerable investment in infrastructure in reserves to facilitate recreation and tourism, including roads, bridges, walking tracks, viewing platforms, picnic facilities, toilets, camping areas, some overnight accommodation, information and interpretation signs as well as management infrastructure including fire trails, water supplies, staff housing, workshops and communications facilities. A conservative estimate of the current cost of this infrastructure is \$230 million.

The annual operating budget for 2005-06 for the Parks and Wildlife Service was approximately \$20 million, of which a significant proportion was spent in administering and managing the 1,108,000 hectares of forests in reserves available for recreation and tourism.

Similarly, there are numerous private companies, partnerships, trusts and individuals who invest in forest management for non-wood products. In addition to non-wood products such as honey, major investment in tourism venture also occurs. Such tourism investments usually focus on buildings and other associated infrastructure and seek to create linkages with forested environments.

There is no estimate of the value of private investment for tourism in reserves. There has been a progressive increase in commercial activities in reserves. In 2006 there were 130 business licences issued within national parks and reserves. Of these, 46 were leasehold businesses involving the lease of reserved land, generally for the provision of

serviced facilities such as cabin accommodation, restaurant, caravan parks or safari style camp - there are now up to 10 such camps located from coast to high country. A further 84 commercial operators were licensed for predominantly activity-based tours such as guided walks, 4-wheel driving and cycling tours. All licensed businesses, particularly leasehold businesses, undertake investment to provide infrastructure, services and or equipment for visitors.

In recent times, the State and Commonwealth governments have invested in protecting and conserving forests on both public and private land. During the reporting period investment on private land was primarily through the Private Forest Reserves Program.

Government bodies such as the Forests and Forest Industry Council (FFIC) are involving the community in forest management. The Tasmanian Forest Industries Training Board provides education and training for people involved in forest management.

In addition to the Hydro Tasmania using water to create power, there are a number of water authorities which supply water for domestic and other uses from forested catchments. These authorities also have made minor investments in forest management.

Non-government bodies such as the Forest Education Foundation (FEF), Timber Communities Australia (TCA), and Australian Forest Growers (AFG) provide education and training for people involved in forest management and involve the community in forest management.

## **INDICATOR 6.2.b INVESTMENT IN RESEARCH, DEVELOPMENT, EXTENSION AND USE OF NEW AND IMPROVED TECHNOLOGIES**

This indicator reports the level of investment and investment trends in research, development, extension and use of technologies to improve forest management for economic, social or environmental purposes.

There is a clear commitment within Tasmania to maintain and strengthen rural and regional economies, communities and the environment in which they operate by encouraging innovation and investment in existing and emerging industries.

Research initiatives have a long history in Tasmania. For example, during the 1920s and 1930s research established the suitability of eucalypts for papermaking. Large timber concessions or long-term rights were granted to companies in return for the development of pulp and paper mills at Burnie, north-west Tasmania, and Boyer, near Hobart. The success of these mills provided the catalyst for other international paper manufacturing companies to utilise Tasmanian eucalypt forest residues and excess bi-products generated from sawmilling operations, with the first exports of these products commencing in 1972.

In 1989 the Forests and Forest Industry Council (FFIC) was established to bring together industrial and conservation forest managers to coordinate a consistent approach to issues such as research and the promotion of new technology, and the development of the Regional Forest Agreement. Since 1989, the FFIC has directly funded initiatives to support:

- thinning research and analysis (\$3,490,000);
- plantation establishment , including aerial spraying, browsing control, soils & forest practices research, species evaluation studies and research staff (\$923,000); and
- forest management of special species timbers research (\$500,000).

To date, 93 per cent of all FFIC project expenditure has focused on technology and marketing sub programs. Table 6.2.b.1 provides an outline of the programs funded since 1989, and the percentage of total expenditure for each program.

**Table 6.2.b.1 Forests and Forest Industry Council funded programs 1987-2005**

Program	Per cent expenditure	Project outcomes
Backsawing seasoning research	27	Re tooling the veneer industry and marketing assistance for new veneer product lines
Backsawing research via CSIRO	12	Support of above
Various other drying and Miscellaneous Studies	15	Development and construction of a state of the art large timber-drying kiln, acquisition of solar kilns and solar hot water kilns and in re-jigging existing semi functional kilns with state of the art control systems.
Backsawn old growth (China Board Group)	2	Backsaw of wide board Tasmanian Oak trials to produce furniture quality timber with unusual wood grain for the Chinese furniture market.
Post graduate student training	8	Papers published included: <ul style="list-style-type: none"> <li>• alternatives to 1080 poison</li> <li>• Prediction of browsing risk in eucalypt plantations and native</li> <li>• Manipulating vegetation and seedling quality to reduce browsing damage</li> </ul>
Capital assistance with seasoning projects	32	Sawing studies of plantation-grown eucalypts, with the aim of understanding the potential for producing quality sawlogs and veneer logs from plantation-grown eucalypts in Tasmania  International publication of "Drying of tangentially-sawn regrowth Tasmanian <i>Eucalyptus obliqua</i> " <i>Holz als Roh-und Werkstoff</i> (2005)
Capital assistance other	2	Indicated good opportunities for the use of preservative treated plantation grown hardwood poles and posts in the agricultural sector in competition with pine.  Discounted the utility and practicality of esoteric drying systems and treatments.  Demonstrated opportunity for dramatic reduction of loss and waste in the timber processing chain.  Demonstrated better drying outcomes of green timber.  Indicated that mature pulpwood cannot be viably processed to sawn timber in current appearance product lines
Thick veneer trials	2	Value adding special species timber into thick sawn highly feature veneer ensuring maximum return on a finite resource

The 1997 Tasmanian RFA and the 2005 Tasmanian Community Forest Agreement both specifically acknowledge the importance to support investment in, and support for, research, development and adoption of new technologies which underpins the competitive performance of Tasmania's forest and wood products industries. For example, the 2005 Tasmanian Community Forest Agreement provided \$250 million to support programs which "enhance forest conservation and the development of forest industries". Features of this Agreement include specific programs to assist the private industry to retool existing mills and improve efficiency and competitiveness as a response to changing markets and in wood supply.

The Tasmanian Government, in partnership with private industry, research and educational organisations supports a wide range of initiatives to facilitate sustainable forest management, enhance the State's natural and cultural heritage, improve wood and fibre performance, increase efficiency and environmental performance of wood and paper processing, and promote value adding for wood and paper products. Strategies adopted include initiatives to:

- Ensure the level of investment in research and development reflects the economic contribution of the forestry and forest products industries;
- Continue to build research and development partnerships to respond to industry needs;
- Improve communication of research and development outcomes to industry participants and communities;
- Improved market and price data for forestry and forest products industries.

Since 1995, at least \$1.4 billion has been invested in developing and adopting new processing techniques and plantation establishment in the Tasmanian forest sector: \$700 million in establishing new plantations and \$700 million in processing sector (Forest Industries Association of Tasmania). The majority of these investments' long-term competitiveness relies on adding value to existing native forests and an expanding plantation resource.

Today, the industry is gradually transforming from using larger, older logs from less intensively managed forests to smaller, actively managed regrowth forest and plantation logs. However, wood from older less intensively managed forest will contribute about 30 per cent of high quality sawlog supply from State forests until 2050.

In the forest management sector, the last five years have seen significant increases in the adoption of a range of new technologies. Notable developments include:

- Widespread investment in Global Positioning System (GPS) technologies for more efficient and accurate mapping of forests, roads, and structures; for on-ground navigation for inventories and surveys; and for recording the flight paths of aerial fertiliser and pesticides spray applications.
- Increased use of Geographic Information Systems (GIS) for forest asset recording, surveys, spatial analysis and reporting, and routine production of forestry field maps.
- Use of satellite remote-sensing for routine monitoring of forest change, (eg as used in the MVEP project reported under Indicator 1.1, and for measuring forest carbon/biomass as reported under Indicator 5.1).
- The implementation of a digital log-docket system, *eDocket*, to allow logs to be recorded on hand-held computers in the forest and then tracked from harvest operations through to processor destinations, allowing improved stock control and more efficient sales administration.
- The adoption of advanced decision support systems such as optimisation of yield strategies and spatial harvest planning.
- Increased use of infrared cameras to detect fire edges and hidden smouldering hot spots which require to be extinguished.

Research and development is therefore vital to ongoing industry investment. While there is already considerable investment undertaken by government, educators and private sector industry participants, there is potential to enhance this effort. In addition, there is the need to ensure that results from research and development are communicated widely to promote opportunities and generate public support. As research and development is undertaken by a variety of organisations the need for cooperation and coordination is paramount to ensuring it is directed at the most productive opportunities.

To achieve a coordinated outcome, the government, industry and educational institutes have established active partnerships, such as the CRC for Forestry which is an Australia-wide research venture established to operate from July 2005 until June 2012. The CRC for Forestry will focus upon new technologies, innovation, value-adding, efficiency and competitive advantage; as well as landscape issues and community engagement. The CRC has its headquarters in Tasmania and receives \$26.6 million cash from the Australian Government and \$57 million cash and in kind contributions from partners over the seven years.

Approximately 40 per cent of the overall CRC for Forestry budget is expended in Tasmania, with research being conducted by the University of Tasmania, CSIRO/ensis and the research arm of Forestry Tasmania. Tasmanian industries contributing resources to the CRC are Forestry Tasmania, Gunns Ltd, Forest Enterprises Australia Ltd and Norske Skog Paper Mills (Australia) Ltd. The Tasmanian Government also supports the research via its Department of Economic Development, FFIC and the Forest Practices Authority.

The CRC for Forestry builds on the work of two previous forestry CRCs - the CRC for Temperate Hardwood Forestry (1991-1997) and the CRC for Sustainable Production Forestry (1997-2005).

The expansion of future resources resulting from more efficient silviculture in native forests and expanding plantation resources as from about 2020, an increasing supply of regrowth and plantation wood will become available thereby increasing the volume of wood available from these forests which is attracting substantial new investment in the forest sector in Tasmania. This investment has been associated with considerable domestic industry restructuring including the entry of international forest sector specialist companies.

## 6.3 Recreation and Tourism

This sub-criterion reports on the area of forest available for recreation and tourism, the range of uses and facilities available and the intensity of usage.

### **INDICATOR 6.3.a AREA OF FOREST AVAILABLE FOR GENERAL RECREATION AND TOURISM**

Indicator 6.3.a reports the extent and proportion of forests available for recreation or tourism. For the purpose of this indicator, an area of forest is considered to be available for recreation and tourism if there is no legal or other form of prohibition on access for recreation and tourism activities. This includes areas where patrons may have to pay for public access to private land (eg. a wildlife park).

There has been little change in the availability of public forest for recreation and tourism since that reported in the 2002 Sustainability Indicators Report; however the available recreation facilities have improved (Indicator 6.3.b).

This indicator complements Indicators 6.1.a and 6.1.b and recognises that forests have diverse non-consumptive uses that are commercially, socially and culturally important. It is therefore important to monitor whether access is provided to forests for recreation or tourism.

The overwhelming majority of forested land reserved under the *Nature Conservation Act 2002* is available for recreation and tourism (the *National Parks and Wildlife Act 1970* has been replaced by the *Nature Conservation Act 2002* and the *National Parks and Reserve Management Act 2002* during the report period). Recreation and tourism remain as statutory management objectives for all reserve classes except for Nature Reserves, Private Sanctuaries and Private Nature Reserves. The area of forest within these reserve classes is 14,000 hectares or just over one per cent of the area of reserved forests. Recreation and tourism activities are not specifically excluded from Nature Reserves; they are not encouraged, as they are not within the management objectives. In the case of the two private land reserve types, public access is a matter of the owner's discretion.

Under the *Nature Conservation Act 2002*, public access can be restricted by declaring a 'restricted area' in a management plan or by erecting a sign prohibiting access. In the reporting period there have been a number of such areas declared through management plans- generally small and created for particular management reasons (eg. protection of islands for seabird breeding and sensitive caves). Access to these areas may be restricted year round or on a seasonal basis. If there are year round restrictions, access may be possible under a permit from the Director of National Parks and Wildlife. There has been a small increase in forested land unavailable for general recreation and tourism. From time to time roads and tracks may be closed for safety reasons as well as environmental protection. Under the *Phytophthora cinnamomi* Strategic Regional Plan for Tasmania, a number of locations in reserves have been identified as "special management areas" where it is recommended that no further formed access be provided so that the introduction of the

root rot fungus can, hopefully, be prevented. Whilst access will not be restricted to these areas, it will not be facilitated through construction of roads and tracks.

Under the *Forestry Act 1920*, Forest Reserves are available for public recreational use, the preservation or protection of features of the land of aesthetic, scientific or other value, and the preservation or protection of species of flora or fauna. The statutory management objectives include “to encourage appropriate tourism, recreational use and enjoyment”. State forest can be accessed for recreational purposes that are not incompatible with the *Forestry Act 1920*. Under the Act public access can be restricted for safety reasons, which is usually a temporary and short-term restriction.

The National Wilderness Inventory in 1996 identified sixteen separate areas of high-quality wilderness in Tasmania. These were used as the basis for reservation analysis under the RFA. Appendix 6.3.a provides updated reservation levels for these high quality wilderness areas. At June 2006, 97 per cent of high quality wilderness areas are protected within the CAR reserve system. This is an increase of 44,000 hectares or 2 per cent since 2001. Although present wilderness values have not been recently reassessed it is likely that activities outside reserved areas have impacted on those values in some locations.

On private forest some recreation, such as camping, hunting and fishing does occur at the owner’s discretion and there are also some small commercial tourism ventures on forested land.

The area of forested land available for general recreation is shown in Table 6.3.a.1.

**Table 6.3.a.1 Area and proportion of total forests available for general recreation and tourism as at 30 June 2006**

		Conservation reserves	Other State forest	Other publicly managed land	Private freehold land**	Total
<b>Area</b> (‘000 hectares)	<b>2002</b>	975*	1,140	81	0	3,365
	<b>2006</b>	1,108	1,128	85	0	3,353
<b>Percentage</b>	<b>2002</b>	29	34	2	0	100
	<b>2006</b>	33	34	3	0	100

\*The text of the 2002 Sustainability Indicators Report indicated that the area of Nature Reserves and the two classes of private reserve under the then *National Parks and Wildlife Act 1970*, where the reserve management objectives did not specifically include recreation and tourism, amounted to about 130,000 hectares. This figure was an over-estimate since it included the 74,715 hectares marine protected area component of Macquarie Island Nature Reserve, as well as small off-shore rocks and islands that do not support forests.

\*\* Some small areas available, less than one thousand hectares, some commercial ventures.

## References

Schahinger, R., Rudman, T. and Wardlaw, T.J. 2003. Conservation of Tasmanian Plant Species and Communities Threatened by *Phytophthora cinnamomi* Strategic Regional Plan for Tasmania, Nature Conservation Branch Technical Report 03/03, Department of Primary Industries, Water and Environment, Hobart.

## **INDICATOR 6.3.b RANGE AND USE OF RECREATION/TOURISM ACTIVITIES AVAILABLE**

This indicator reports the range of recreation and tourism facilities available in forests and how much the facilities are used. This indicator complements Indicators 6.1.a and 6.1.b and recognises that forests have many non-consumptive uses that are commercially, socially and culturally important.

Some of these facilities (for example, walking or riding tracks, picnic sites and camp grounds) are usually provided solely for recreation or tourism while others (for example, roads and vehicular tracks) are provided for a range of management purposes and are also available for use for recreation and tourism.

### **Recreation Facilities and Activities Available**

Table 6.3.b.1 lists the recreation facilities and activities available in 2005-06 on State forest and reserves managed by the Parks and Wildlife Service.

In addition to these activities, climbing, abseiling, caving, cycling, nature observation, photography and swimming are all further activities that continue on State forest and in reserves. Hunting continues to be allowed on State forest and on some reserve classes: game reserves, conservation areas, and regional reserves. There have been no significant observed changes in the nature or level of these activities over the past five years.

In addition to public huts and cabins shown in Table 6.3.b.1 there has been growth in the level of commercial accommodation available in reserves. There are eight leases for commercial accommodation including bunkhouse, basic cabin and more comfortable cabin style in locations including Cradle Mountain, Lake St Clair and Freycinet. There are also now nine licensed camps in reserves – providing commercial guided camping experiences.

Two new tourism locations have been opened by Forestry Tasmania since 2001-2002. These are the Scottsdale Eco Centre at Scottsdale in the north east, and Dismal Swamp on State forest about 30 kilometres south west of Smithton in the north west of the State. Numerous other sites on State forest have been maintained, providing for a wide range of activities. Sightseeing, walking, picnicking, fishing and camping remain the more popular recreational activities carried out on State forest. Facilities for these, and other, activities are maintained and upgraded where required.

A major visitor facility development program, the Nature Based Tourism Development Program, funded from a variety of local, state and federal sources was completed in 2003. Various new facilities were constructed including new visitor centres at Hastings Caves, Mt Field, Freycinet and Narawntapu National Parks; upgraded signage and promotion of the 60 Great Short Walks across tenures; an innovative package of facilities and features across tenures in the Great Western Tiers/Kooparooka Niara; major upgrading of the Tasman Coastal Trail and replacement and upgrading of day use facilities at Rocky Cape National Park that had been destroyed by fire.

**Table 6.3.b.1 Facilities available in forests for recreation and tourism activities 2005-06**

Facility/Activity	State forest	National Parks and Nature Conservation Act reserves
Disabled access	25	nd
Information/Visitor Centre	9	16
Toilets	26	350
Gas barbecue	7	nd
Wood barbecue	20	nd
Picnic shelter	21	97
Picnic area	30	205 <sup>1</sup>
Fireplace	16	nd
Boat ramp	3	nd
Lookout (platform)	20	72
Walking track	58 <sup>2</sup>	See breakdown below
Short walk	47	126
Day walk	24	194
Overnight walk	1	83
Camping area (vehicle access)	9	124 <sup>3</sup>
Camping area (foot access)	0	111
Caravan site	5	Nsa <sup>4</sup>
Accommodation (walkers huts)	0	21 <sup>5</sup>
Accommodation cabins	0	20 <sup>6</sup>
Self-guided interpretation	46	nd
Guided interpretation	5	nd
Interpretation booths	nd	52
Wildlife observation hides	0	4
Education	29 <sup>7</sup>	nd
Cultural Heritage <sup>8</sup>	20	nd
Mountain bike riding <sup>9</sup>	21	nd
Trail bike riding <sup>10</sup>	8	11
Recreational vehicle driving <sup>11</sup>	nd	92 <sup>12</sup>
Horse riding	12 <sup>13</sup>	nd
Boating	2	nd
Canoeing	6 <sup>14</sup>	nd
Fishing	15	Nd <sup>15</sup>
Hang gliding	1	1
Playground equipment	1	5
Skiing (skifields with facilities)	0	2
Special events	7	nd
Licensed tourism businesses	nd	130 <sup>16</sup>

nd – no data available

<sup>1</sup> Parks and Wildlife Service (PWS) – defined by number of picnic tables (likely to be an under-estimate since approximately 500 sites have been identified as available for day use)

<sup>2</sup> Forestry Tasmania (FT) – formed walking tracks

<sup>3</sup> PWS – includes formal camping areas and camping areas as small as one site

<sup>4</sup> PWS – not separately available – included in camping area figures

<sup>5</sup> PWS – includes “easy access” huts and bush walkers huts

<sup>6</sup> PWS managed

<sup>7</sup> FT – areas where educational material is available

<sup>8</sup> Sites that showcase cultural heritage, which includes interpretation. For PWS this would include 12 forested Historic Sites and the majority of the 52 interpretation booths since these usually include a cultural heritage component

<sup>9</sup> FT/PWS – all public roads are available, FT figure includes areas where mountain bikes are commonly directed

- <sup>10</sup> FT/PWS - all public roads are available for licensed riders. Figures represent tracks published in the Ride Around Tasmania booklet.
- <sup>11</sup> FT/PWS - all public roads are available for licensed drivers and registered vehicles.
- <sup>12</sup> PWS – vehicle tracks identified on asset management system as available for recreational vehicle driving
- <sup>13/14</sup> FT – areas where users are commonly directed
- <sup>15</sup> Fishing is permitted in all reserves, subject to Inland Fisheries regulations
- <sup>16</sup> Includes accommodation, transport and guided services.

Overall there has been an increase in the number of facilities available for recreation and tourism across tenures. This has been most evident in the provision of major day use facilities enabling a wide range of visitors to experience forest in a variety of ways.

Current data for State forest and national parks and reserves are now documented under established asset management systems. Much of the visitor asset data for parks and reserves has now been recorded but is still not completed; therefore, all figures for infrastructure should be considered under-estimates. Detailed comparison with 2001 data is difficult due to differences in definition.

### **Number of Visits to Recreational Sites**

This indicator provides information on the number of visits made to specific reserves (in some cases parts of reserves).

For several national park destinations – Cradle Mountain, Lake St Clair and Freycinet – there have been downward revisions to data provided to the 2002 Sustainability Indicators Report, hence making comparisons with the previously reported data difficult to follow.

The basic visitor trend across the whole National Park and State forest system has been growth throughout 2001-02 and 2002-03, with visitor numbers peaking in 2003-04 or 2004-05. Then followed by a period where numbers stabilised before falling.

This growth, peak and decline have moved in line with visitor numbers to Tasmania (as collected by Tourism Tasmania).

The growth was in response to a range of factors. The introduction of low air fares made travel to Tasmania attractively priced. At the same time, more seats were made available for visitors to travel on - initially via the two new Spirits of Tasmania operating to Melbourne, then as the airlines introduced more seats, and later by the addition of the third ferry to Sydney. As more visitors came to Tasmania, they dispersed out more or less evenly throughout parks, reserves and State forest.

The later decline was also in response to a combination of factors. Cheap airfares and extra capacity made travel more accessible. Cheap international airfares and a stronger Australian dollar encouraged Australians to travel overseas instead of interstate. Many Australians are purchasing consumer goods items instead of taking holidays. Also, many Australians are not using all their annual leave, and also are taking more trips, but the trips are shorter.

There have been declining visits across the whole reserve and State forest system in Tasmania - no single park/forest destination seems to have declined significantly more than others.

The new visitor destinations on State forest – Tahune Airwalk and Dismal Swamp - were well attended, together receiving 158,220 visitors in 2005. However, the number of visitors dropped in 2006 to 135,330, as did visitation to most of the major visitor sites across all tenures.

The East Coast Interpretation Centre was funded from the Regional Forest Agreement (RFA), the Natural Heritage Trust and the State Government’s Capital Investment Program and asset sales. The project involved the construction of an interpretation Centre located within the Freycinet National Park to provide visitors to this icon site a clear orientation point for the interpretation the natural and forest features of the East Coast region. This project has resulted in a high quality visitor orientation centre. The centre provides a first point of call for visitors, highlights opportunities for experiencing natural and cultural values in the park as well as throughout the region as well as providing a focus for activities such as the ranger discovery program. The centre was located to minimise disturbance to the rich Aboriginal heritage in the area. Approximately 20 full time positions were created during construction of the centre and site works and staff equivalent to seven full time employees manage the centre and associated facilities.

**Table 6.3.b.2 Level of use for recreation and tourism activities – visitor numbers/estimates to recreational sites**

Site	Tenure	Unit of measurement <sup>a</sup>	2000-01	2003-04	2004-05	2005-06
<b>Ben Lomond</b>	National Park	Person-visit	32,000	52,000	54,000	nd
<b>Cradle Mountain (Lake Dove)</b>	National Park	Person-entry	186,000	181,468	184,945	170,120
<b>Lake St Clair (Cynthia Bay)</b>	National Park	Person-entry	112,000	105,152	98,133	92,810
<b>Douglas Apsley (Rosedale Road)</b>	National Park	Person-entry	nd	18,000	20,000	nd
<b>Franklin-Gordon Wild Rivers (Gordon River cruise)<sup>b</sup></b>	National Park	Person-visit	91,400	105,500	93,200	87,000 <sup>c</sup>
<b>Freycinet (Main entrance)</b>	National Park	Person-entry	273,000	197,645	206,436	203,046
<b>Hartz Mountainss</b>	National Park	Person-visit	13,000	14,000	13,000	11,800
<b>Mole Creek Karst</b>	National Park	Person-visit	45,534	45,423	43,568 <sup>d</sup>	46,809
<b>Mt Field</b>	National Park	Person-entry	139,000	130,855	128,959	116,547
<b>Maria Island (Darlington)</b>	National Park	Person-visit	13,020	12,741	14,911	14,600
<b>Narawntapu (Via Bakers Beach)</b>	National Park	Person-visit	34,000	40,680	47,135	45,329
<b>South Bruny</b>	National Park	Person-visit	23,000	36,000	34,000	nd

Table 6.3.b.2 (contd)

Site	Tenure	Unit of measurement <sup>a</sup>	2000-01	2003-04	2004-05	2005-06
<b>Southwest</b>			50,000 (est total)			
Southern access via Cockle Creek	National Park	Person-visit		26,000	22,000	nd
Northern access via Maydena	National Park	Person-visit		39,000	39,000	nd
<b>Tasman</b> (whole of park)	National Park	Person-visit	264,000	191,000	nd	nd
<b>Walls of Jerusalem</b> <sup>c</sup>	National Park	Person-visit	3,500	5,100	nd	nd
<b>Hastings Caves</b> (Newdegate Cave)	National Park	Person-visit	24,829	29,753	28,556	28,692
<b>Scottsdale EcoCentre</b> <sup>e</sup>	State forest	Person-entry	Not open	48,000	38,683	35,456
<b>Evercreech</b>	Forest Reserve	Person-entry	nd	4,452	4,799	3,463
<b>Hollybank Forest</b>	Forest Reserve	Person-entry	27,200	10,600	24,774	24,178
<b>Mt Victoria</b>	Forest Reserve	Person-entry	6,300	10,300	12,987	8,857
<b>Sandspit</b>	Forest Reserve	Person-entry	12,800	10,900	8,500	nd
<b>Bruny</b>	State forest	Person-entry	21,200	31,100	28,100	18,193
<b>Tahune</b> <sup>e</sup>	Forest Reserve	Person-entry	16,900	142,900	122,420	108,330
<b>Liffey</b>	Forest Reserve	Person-entry	21,700	26,800	29,900	19,304
<b>Upper Mersey Valley</b>	State forest	Person-entry	12,400	27,600	18,800	25,620
<b>Dismal Swamp</b> <sup>e</sup>	Forest Reserve	Person-entry	Not open		35,800 <sup>f</sup>	27,000
<b>Oldina</b>	Forest Reserve	Person-entry	20,700	28,500	23,917	22,204

Notes:

- a. *person-entry*: occurs whenever a person enters a protected area (derived from traffic counts) (most Forestry Tasmania data are of this type)  
*person-visit*: recorded when a person visits a protected area for the first time or on the first day of the stay  
This terminology was recommended by the ANZECC Benchmarking and Best Practice Program, *National Data Standards on Protected Areas Visitation* (Victorian National Parks Service, September 1996).
- b. Estimates based on annual Tasmanian Visitor Survey; includes only interstate and overseas visitors aged 15 years and over
- c. 12 months ending March 2006
- d. Only walkers registering at main car park.
- e. Actual visitor numbers based on ticket sales or door counts
- f. Dismal Swamp visitor centre opened in September 2004
- <sup>g</sup>: King Solomons Cave closed for part of year
- nd no data available

## 6.4 Cultural, social and spiritual needs and values

This sub-criterion reports on the area of forest to which Indigenous people have use and rights to protect their special values and the extent to which these values are protected by Indigenous participation in forest management.

The sub-criterion also reports on the protection of non-Indigenous cultural values and the importance of forests to people.

### **INDICATOR 6.4.a AREA OF FOREST TO WHICH INDIGENOUS PEOPLE HAVE USE AND RIGHTS THAT PROTECT THEIR SPECIAL VALUES AND ARE RECOGNISED THROUGH FORMAL AND INFORMAL MANAGEMENT REGIMES**

This indicator, which has been modified from that reported against in the 2002 Sustainability Indicators Report, reports on the maintenance of an acceptable level of accountability for the protection of Indigenous peoples' cultural, religious, social and spiritual values. This is done by ensuring that adequate land is placed appropriately under the range of tenure classifications and/or dedicated management regimes to protect Indigenous peoples' values associated with forests.

Aboriginal people have formal use and rights by virtue of land title over areas identified under the *Aboriginal Lands Act 1995*.

Formal and informal management regimes that recognise Aboriginal values have been established under the *Aboriginal Relics Act 1975*, the *National Parks and Reserves Management Act 2002* and the *Forestry Act 1920*.

#### ***Aboriginal Lands Act 1995***

The *Aboriginal Lands Act 1995* provides for the transfer of specified areas of Crown land to the Aboriginal community. This Act established the Aboriginal Land Council of Tasmania (now the Tasmanian Aboriginal Land and Sea Council (TALSC)) as a statutory body to hold and manage land on behalf of the Aboriginal community in perpetuity.

In 2005 a further two areas of land – Cape Barren Island (42,706 hectares) and Clarke Island (8,149 hectares) - were transferred to the Aboriginal Land Council of Tasmania, making a total of 15 areas returned to date. Unlike other land transfers, Cape Barren Island contains large areas of forest.

Management of Cape Barren Island is undertaken by the Cape Barren Island Aboriginal Association. The Tasmanian Aboriginal Centre runs a youth justice program on Clarke Island.

### ***Aboriginal Relics Act 1975***

All forest land on all tenures is subject to the *Aboriginal Relics Act 1975* which is the main piece of State legislation affecting Aboriginal heritage and intended to provide comprehensive protection for all Aboriginal heritage. The Government consults with the Aboriginal community through the Tasmanian Aboriginal Land and Sea Council (TALSC) to help it meet contemporary social expectations in determining how to protect Aboriginal heritage. The legislation does not regulate the range of Aboriginal values identified under this indicator, nor does it include requirements for Aboriginal participation in forest management identified under Indicator 6.4.c.

Whilst the terminology in the *Aboriginal Relics Act 1975* and its integration with more recent legislation is dated, the purpose of the Act is clear: it is an Act to make provision for the protection of Aboriginal heritage. It is intended to ensure that any action that affects Aboriginal cultural heritage (called 'relics' in the Act) is subject to strict investigatory, scientific and administrative controls. Contemporary social expectations must also be met in determining how to protect Aboriginal cultural heritage. Under the legislation, all people have a duty to report finding Aboriginal heritage, and to deal with Aboriginal heritage only through the mechanism of a permit issued by the Minister. A permit is required where a proposed activity would damage or destroy an Aboriginal relic. The Aboriginal Heritage Office which administers the *Aboriginal Relics Act 1975*, seeks the advice of TALSC in relation to permits under the Act.

The *Environmental Management and Pollution Control Act 1994*, the *Land Use Planning and Approvals Act 1993*, the *National Parks and Reserves Management Act 2002*, the *Nature Conservation Act 2002*, and the *Forest Practices Act 1985* complement the *Aboriginal Relics Act 1975*. The *Coroners Act 1995* also has specific provisions relevant to Aboriginal heritage, as do a number of other State Acts, including the *Aboriginal Lands Act 1995*, and *Museums (Aboriginal Remains) Act 1984*. Regulations under the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* and the *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* also affect how Aboriginal heritage should be dealt with in the State. All legislation relevant to the environment is likely to have some relevance to Aboriginal heritage protection.

Over the five year period from July 2001 to June 2006 a total of 1365 new Aboriginal heritage places across all land tenures were recorded in the Tasmanian Aboriginal Site Index. During this period, a total of 182 permits were authorised under the *Aboriginal Relics Act 1975*.

### **New Legislation**

New Tasmanian Aboriginal heritage legislation is being developed to replace the *Aboriginal Relics Act 1975*. Consultation on the new legislation began in July 2005, with meetings involving the Aboriginal community, key interest groups and the general public. The new legislation is intended to:

- establish an improved legislative framework for the protection of Aboriginal heritage;
- establish a decision-making role for the Aboriginal community;
- create greater certainty for land owners, users and managers;

- integrate with existing planning systems; and
- be fair and equitable.

### **Forest Practices System**

The Forest Practices Code 2000, established under the *Forest Practices Act 1985*, provides for the assessment, planning, management and protection of Aboriginal heritage within production forests.

A full-time Aboriginal Heritage Officer works with the Forest Practices Authority and provides advice on all areas covered by Forest Practices Plans.

Of the new Aboriginal heritage places identified across all land tenures during the period from July 2001 to June 2006, 427 places were located by the Forest Practices Authority's Aboriginal Heritage Officer in the course of surveys required under the Forest Practices Code.

Due to difficulty of identifying places in forests, most of these places were identified during the course of forest harvesting activities and plantation development. All of these places have subsequently been protected in informal reserves in which no further disturbance is permitted.

During the period July 2001 to June 2006, a total of 182 permits were issued under the *Aboriginal Relics Act 1975*. Of these permits, three applied to plantation forest where places were identified prior to harvesting. All three were granted to a private timber company.

### ***National Parks and Reserves Management Act 2002***

For all public reserve categories listed in Schedule 1 of the *National Parks and Reserves Management Act 2002*, the objective is “*to encourage cooperative management programs with Aboriginal people in areas of significance to them in a manner consistent with the purposes of reservation and the other management objectives*”. The management objectives for all reserves under the Act provide for the conservation of Aboriginal heritage values. The Act does not preclude Aboriginal cultural activities on reserved land if these do not adversely affect the flora and fauna.

The National Parks and Reserved Land Regulations 1999 protect all ‘Aboriginal relics’ and items of archaeological or historical interest.

As a result of government agency restructuring, staff dedicated to managing Aboriginal heritage under the *Aboriginal Relics Act 1975* are no longer employed as part of the Parks and Wildlife Service; however, both the Aboriginal Heritage Office and Parks and Wildlife Service remain under the same Government agency, the Department of Tourism, Arts and the Environment.

A formal lease to occupy and use 10 hectares of reserved land at Eddystone Point has been agreed between the Aboriginal Land Council of Tasmania and the Director of National Parks and Wildlife. Informal arrangements are in place to facilitate Aboriginal cultural activities in certain reserves.

Management plans for ten national parks and reserves approved in the reporting period recognise Aboriginal cultural heritage values and include strategies for management in consultation with the Aboriginal community. In particular, the Arthur Pieman Conservation Area Management Plan 2002 aims to “facilitate and enrich Aboriginal community use of the area, its resources and educational opportunities.”

New activities proposed in reserves are assessed for impacts on Aboriginal sites and the Aboriginal community is consulted where there are known interests, in accordance with the *Reserve Management Code of Practice 2003*.

Sundown Point (132 hectares), Trial Harbour (0.826 hectares) and West Point (580 hectares), formerly Aboriginal Sites under the now repealed *National Parks and Wildlife Act 1970*, remain as State Reserves under the *National Parks and Reserves Management Act 2002*. The Government’s intention that these lands would be transferred to Aboriginal ownership has not yet been realised.

### ***Forestry Act 1920***

The Forestry Act, 1920, Schedule 3, includes among the objectives for management of Forest Reserves “to conserve sites or areas of cultural significance” and “to encourage cooperative management programs with Aboriginal people in areas of significance to them”. All management plans (seven for Tasmania) for State forest include the following two objectives:

- conserve places, sites and features of Aboriginal and other cultural significance; and
- encourage cooperative management programs with Aboriginal people in areas of significance to them in a manner consistent with other management practices.

Procedures have been developed and implemented to ensure Aboriginal sites are managed in accordance with legislative requirements.

On State forest, known sites and identified new sites are specifically recognised in the Management Decision Classification (MDC) System, and are coded with Special Management Zones to flag Aboriginal and cultural heritage sites. As at 30 June 2006 about 49 000 hectares of State forest is zoned for indigenous and non-indigenous cultural heritage special management. This compares with about 37 700 hectares zoned for equivalent cultural heritage management in 2001.

In addition to special management zones, all known Aboriginal sites in State and private forests are managed by avoidance of impact, as required by the *Aboriginal Relics Act*.

## **INDICATOR 6.4.b REGISTERED PLACES OF NON-INDIGENOUS CULTURAL VALUES IN FORESTS THAT ARE FORMALLY MANAGED TO PROTECT THESE VALUES**

This indicator reports on the extent of public land that is specifically dedicated to the management of historic heritage values. These areas are managed for the heritage values that may relate to historic mining, timber-extraction or agricultural sites, as well as historic tracks, tramways, huts, fences and the like.

Historic places on the federal National Heritage Register come under the provisions of the *Environment Protection and Biodiversity Conservation Act 1999* which prohibit any actions likely to have a significant impact on the National Heritage values of the places. Historic places on the federal Register of the National Estate (RNE) are generally also included on the Tasmanian Heritage Register (THR) and compliance with THR requirements also meets RNE obligations.

Historic sites of significance are protected by formal and informal reserves. On State forest, areas specifically zoned for the management of historic heritage are identified in the Management Decision Classification (MDC) System as Special Management Zones for Cultural Heritage. About 1400 sites on State forest are specifically managed to protect non-indigenous cultural heritage. These are managed in MDC with Special Management Zones which, when combined with indigenous areas, exceeds 49,000 hectares.

Individual historic sites on public and private land that are subject to forest practices plans are assessed and managed in accordance with the Forest Practices Code.

Under the *Nature Conservation Act 2002*, 29 places are designated Historic Sites covering a total area of 16,074 hectares of which approximately 4,320 hectares are forested. In addition, regulations governing the use of all reserved land under the Act prohibit unauthorised removal, damage, defacement or disturbance of any object or archaeological, historical or scientific interest. Historic heritage sites within formal reserves are managed in accordance with the Tasmanian Reserve Management Code of Practice. As well, individual sites are identified and may be further protected by prescriptions contained within relevant reserve management plans.

The Tasmanian Historic Places Index (THPI) contains 1712 places in forest of all tenures throughout the State. Of these, 804 are on State forest, 463 in reserves under the *Nature Conservation Act 2002* and the remaining 465 places are on either freehold, Commonwealth, other Crown or Council land. These places range from those that are highly significant in historic heritage terms to some which have not had their significance assessed. The database is no longer being actively managed.

The Forest Practices Code requires that all sites found in the preparation of a Forest Practices Plan are reported. As a result an additional 518 historic sites have been identified and managed in wood production forests since 2001.

The Tasmanian Heritage Council is progressively assessing properties on public land for inclusion on the Tasmanian Heritage Register. Data are only readily available for sites on

the Register that are in reserves. There are four sites on the Register that are located in national parks and reserves: Darlington within the Maria Island National Park (10,300 hectares), Ida Bay State Reserve and McLachlan & Co. Southport Whaling Station and Imlay's Southport Whaling Station (both within the Southport Conservation Area). A further 18 sites in forests in reserves have been nominated for the Register or are in the process of assessment.

The Port Arthur Historic Site and the North East Peninsula, Recherche Bay are on the National Heritage Register. Both Darlington and the Coal Mines Historic Site have been nominated for this Register and are also part of a proposed serial listing of Australian convict sites that is being nominated for inclusion on the World Heritage List.

The data in Table 6.4.b.1 below is only readily available for sites in reserves under the *Nature Conservation Act 2002*.

**Table 6.4.b.1 Number of places of non-indigenous cultural heritage in forests that are formally managed to protect the cultural values**

<b>Australian Historic Themes (Australian Heritage Commission 2001)</b>	<b>Number of places recognised at the national level</b>	<b>Number of places recognised at the state level</b>
2.3 Coming to Australia as punishment	2 (Port Arthur Historic Site & North East Peninsula, Recherche Bay)	
2.3 Coming to Australia as punishment		1 (Maria Island National Park)
3.4 Utilising natural resources		4 (Maria Island, Ida Bay, Whaling Stations)
3.7 Establishing communication		Mt Direction Semaphore Station
3.8 Moving goods and people		1 (Ida Bay)
3.16 Struggling with remoteness, hardship and failure		4 (Maria Island, Ida Bay, Whaling Stations)

The Tasmanian Heritage Council may enter a place of historic cultural heritage significance in the Heritage Register if, in its opinion, it meets one or more of the following criteria:

- (a) It is important in demonstrating the evolution or pattern of Tasmania's history;
- (b) It demonstrates rare, uncommon or endangered aspects of Tasmania's heritage;
- (c) It has potential to yield information that will contribute to an understanding of Tasmania's history.

## **Recent Discoveries**

In 2003 as part of the preparation of a Forest Practices Plan for an area of State forest in the north east a Forest Practices Officer located a Chinese miners' camp that had not been disturbed since it was abandoned over 100 years ago. This exciting find was reported to the Forest Practices Authority cultural heritage section. This type of site is of national significance and therefore needed management and protection. Together with staff from Forestry Tasmania it was decided that the best management would be to have the site professionally excavated by an archaeologist and the finds lodged with the Queen Victoria Museum. There is a long history of disturbance and destruction of other Chinese sites by collectors. The camp contained a large numbers of bottles, pottery items such as soy sauce bottles as well as an array of domestic utensils. A report was prepared and is available to local residents as well as academic researchers. Display boards were also prepared to promote better understanding of the Chinese heritage. Although most of the artefacts are in the Museum, the hut footprint itself is managed within an informal reserve.

## **INDICATOR 6.4.c THE EXTENT TO WHICH INDIGENOUS VALUES ARE PROTECTED, MAINTAINED AND ENHANCED THROUGH INDIGENOUS PARTICIPATION IN FOREST MANAGEMENT**

This indicator reports the extent to which Indigenous people participate in forest management. There are different levels of participation ranging from national representation and/or participation in forums, down to local on the ground participation in activities relating to the operational management of forests.

Since the 2002 Sustainability Indicators Report agency restructuring has resulted in changed administrative arrangements for the *Aboriginal Relics Act 1975*, with formation of the Aboriginal Heritage Office (AHO) as a distinct unit within the Department of Tourism, Arts and the Environment (DTAE) (formerly the Aboriginal Heritage Section within the Department of Primary Industries, Water and Environment). AHO staff levels have fluctuated over the reporting period but as at June 2006 the Office had four full-time and five fixed term staff. Of these nine staff six are Aboriginal. The AHO retains responsibility for maintaining the Tasmanian Aboriginal Site Index, processing permits under the Act taking into account the advice of the Tasmanian Aboriginal Land and Sea Council (TALSC), and advising on survey and management of Aboriginal heritage sites across all tenures. However, involvement by staff in management of Aboriginal heritage on reserved land is now on a needs basis and is generally not undertaken.

All public land forest managers maintain a dialogue with the TALSC and consult on management of Aboriginal sites.

The Forest Practices Authority (FPA) continues to employ an Aboriginal person as a full-time Senior Aboriginal Heritage Officer. The responsibilities of this officer continue as outlined in the 2002 Sustainability Indicators Report. The FPA sponsored a fixed term position for 10 months in 2005 to provide training and work experience for an additional Heritage Officer.

Forestry Tasmania (FT) employed an Aboriginal Cultural Liaison Officer during 2003-04 and has developed an Aboriginal employment strategy. The Parks and Wildlife Service (PWS) has no identified Aboriginal heritage position, although a number of Aboriginal people are employed in various roles within the organisation.

During the report period all public land forest managers have taken steps to provide opportunities for Aboriginal trainees. In 2004 the PWS introduced a new two year Aboriginal trainee program involving five young Aboriginal people. Two of the trainees are now employed in the organisation. It has been decided to target two base grade ranger positions in areas where there is a high component of Aboriginal heritage management for Aboriginal people and this process has commenced. FT has established a bursary for an Aboriginal cadetship at the University of Tasmania and approved an internal technical forester traineeship for an indigenous person. As reported above, the FPA employed a trainee Aboriginal Heritage Officer during 2005.

Both the PWS and FT have run Aboriginal cultural awareness training programs for agency staff to assist them in enhancing understanding of Aboriginal culture and developing good working relations with Aboriginal communities. The FPA runs regular

training workshops on Aboriginal heritage for all Forest Practices Officers and other forest planners.

Within reserves under the *Nature Conservation Act 2002*, sites of Aboriginal heritage importance are generally protected and, where appropriate and agreed by the Aboriginal community, interpreted. Existing activities and new proposals in reserves that may impact on Aboriginal heritage values are assessed and managed according to guidelines in the *Tasmanian Reserve Management Code of Practice 2003*, including consultation with relevant Aboriginal groups.

Aboriginal involvement in reserve management is formalised through dedicated Aboriginal community positions on two reserve advisory committees: the joint Commonwealth/State Consultative Committee for the Tasmanian Wilderness World Heritage Area (TWWHACC) and the Arthur-Pieman Conservation Area Management Advisory Committee. The TALSC also has observer status on the TWWHACC.

A program to increase Aboriginal management of Aboriginal values through identifying specific areas of interest established under the *Tasmanian Wilderness World Heritage Area Management Plan 1999*, has not progressed.

FT has sought to recognise and integrate Aboriginal cultural activities at FT tourist icons, eg. sale of indigenous cards and jewellery, cultural healing ceremonies, display of Aboriginal art and acknowledgement of Aboriginal peoples' country. FT has recognised and participated in NAIDOC week by providing a month long inter-college exhibition of arts and crafts by Aboriginal students and the production of "Island Spirit Art" card packs, featuring Aboriginal artists work in Tasmania.

The TALSC has noted an improvement in engagement by forest industry participants, but has expressed concern about the change in the permanent/fixed term ratio of employment of Aboriginal people involved in heritage management at the DTAE. There has however been an increase in the overall number of Aboriginal people employed in the agency on heritage management, and employment in a PWS Aboriginal trainee program. The TALSC has also expressed concern that the funding for Aboriginal heritage management in the Tasmanian Wilderness World Heritage Area (TWWHA) has been significantly reduced, and that there is no longer an Aboriginal position for TWWHA activities.

To assist in the identification and protection of Aboriginal sites and values there were 2,162 surveys completed of which 1,531 surveys were completed by Aboriginal Heritage Officers under the requirements of the *Forest Practices Code* from July 2001 to June 2006.

## **INDICATOR 6.4.d THE IMPORTANCE OF FORESTS TO PEOPLE**

This indicator recognises the range of attitudinal values that communities and individuals place on forests. These values tend to be higher level values that may be associated with social justice, biodiversity, clean air and water, social equity or simply the knowledge that Tasmania's forests exist.

This is a new indicator that was not reported in the 2002 Sustainability Indicators Report. No data are available to report on this indicator in this report. This indicator will be the subject of an attitudinal survey undertaken as part of a consultancy with the Bureau of Rural Sciences' Social Sciences Program for the 2007 national State of the Forests Report.

The Cooperative Research Centre (CRC) for Forestry has recognised that Australia's forest industries are undergoing rapid change, as are the perceptions of different groups about forestry. It has been acknowledged that it is essential to understand the social and economic implications of these industry changes and to develop effective community engagement processes.

To this end the CRC for Forestry has commissioned the Communities Project to be undertaken in Tasmania. The Communities Project will develop an understanding of the social and economic dimensions of forest industries in Tasmania by examining:

- The socio-economic costs and benefits of different types of commercial forestry;
- Community attitudes towards commercial forestry, and how these change;
- Feasible and effective strategies for the forest industry to engage local communities; and
- Participatory modelling guidelines and tools to inform stakeholder dialogue about trade-offs between production, water, biodiversity, visual amenity and other community requirements.

The Communities Project will provide independent research to improve the understanding of these issues into the future.

Specifically in relation to this Sustainability Indicator, researchers from the University of Melbourne will also be contributing to the Communities Project by undertaking large quantitative survey samples from across communities in the regions that are being studied. This component of the project will provide an understanding of the values that people place on forests.

The Communities Project is not due to be completed until March 2007. It is expected that the findings of this research project will provide comprehensive information for the 2012 RFA Review.

## 6.5. Employment and community needs

This sub-criterion reports on direct and indirect employment in the forest sectors and wage rates. The health and welfare is also considered important and trends in work injury rates are reported.

The resilience of forest dependent communities, including Indigenous communities to changing social and economic conditions is also discussed.

### **INDICATOR 6.5.a DIRECT AND INDIRECT EMPLOYMENT IN THE FOREST SECTOR**

Employment is an important measure of the contribution of forests in meeting community needs.

Direct employment is defined as employment in the wood and wood product industries and forest contact industries - that is, those industries in direct contact with forests (eg beekeeping, eco-tourism operations, grazing, forest reserve management).

Indirect employment is the 'other' employment generated by direct forest employment. That is, the potential multiplier effect of direct forest employment.

Direct employment in manufacturing industries is measured and reported by the Australian Bureau of Statistics (ABS). This information is compiled from an annual survey of manufacturing establishments. The 2002 Sustainability Indicators Report provided data on forestry industry employment in the wood manufacturing and paper and paper products manufacturing industry sectors. Employment data relevant to the forestry industry in sectors such as forest management, harvesting, and transport sectors were not available.

Since 2002, employment specific to the forestry industry is no longer published by the ABS. Forestry data are now aggregated with agriculture and fishing making it impossible to identify forestry specific data. Thus a comprehensive measurement of employment in the forestry industry as a whole is not available from published ABS data.

In addition, ABS figures for direct employment in the forest industry do not include all those who are actually employed in the industry such as forest product transport operators. However, the ABS does publish employment figures for the Tasmanian Wood and Paper Manufacturing Industry, as part of the data it publishes in the publication *Manufacturing Industry Australia* (Catalogue Number 8221.0).

In the 2002 Sustainability Indicators Report, it was reported that Grist, Tran, and Ball (2000) estimated a total of 8,259 full-time equivalent workers were employed in the Tasmanian forest sector in 1999-2000. Since 2002, only one authoritative survey of the forestry industry has been conducted.

The 2003 Forest and Forest Products Employment Skills Company (FAFPESC- now known as ForestWorks) report, *Forest and Wood Products Industry Workforce and Industry Data Collection Survey Report 2002 – 2003* is currently the most comprehensive and accurate source of direct and indirect forestry employment data. The data for this report were collected through a questionnaire and phone survey. The report also examined

various sources of publicly available data on the forest and wood products industry. The findings of the report confirm that ABS statistics do not provide the level of data needed to accurately reflect the direct and indirect forestry related employment.

The FAFPESC survey identified that there were 10,693 employees in the forest industry in 2003.

There are no specific figures available on indirect employment resulting from the forestry industry in Tasmania, although Felmingham (2002) reported that Tasmanian forest industry multipliers from input-output analysis vary from 1.8 to 2.3. If a multiplier of two is used, this would mean that for every dollar and job created directly by the forest sector another dollar and job is generated in indirect employment.

The forest industry supports a range of suppliers and service providers to the industry, such as suppliers, manufacturers, and maintenance providers of logging and wood processing equipment, fuel and fertilizer suppliers, financial and training service providers, etc. Increased wage spending also creates and supports jobs in other sectors, such as shops, schools and hospitals. Without this indirect employment many regional communities would be disadvantaged both socially and economically.

Australia's forest industries are undergoing rapid change, as are the perceptions of different groups about forestry. It has been recognised that it is essential to understand the social and economic implications of these industry changes and to develop effective community engagement processes. The current Communities research project being undertaken in Tasmania by the Centre for Cooperative Research for Forestry is expected to provide comprehensive information for the 2012 RFA Review. While the project has begun, it is not due to be completed until March 2007. The project is expected to provide a better understanding of the social and economic dimensions of forest industries in Tasmania by examining:

- The costs and benefits of commercial forestry;
- Community attitudes to commercial forestry;
- Community engagement strategies for the forestry sector; and
- Guidelines and tools for participatory modeling and informing stakeholder dialogue.

The Communities research project will provide independent research to improve understanding of these issues.

### **Wood and Paper Manufacturing**

The 2004-05 Manufacturing Industry Australia report indicates that the wood and paper product manufacturing subdivision was ranked the second highest source of employment for manufacturing in Tasmania. Table 6.5.a.1 provides data on employment for the Wood and Paper Manufacturing industry in Tasmania.

**Table 6.5.a.1 Employment in the Tasmanian Wood and Paper Product Manufacturing Industry Subdivision (ANZSIC code 23)**

Year	2000-01	2001-02	2002-03	2003-04	2004-05
<b>Employment at end of June ('000)</b>	2.9	np	np	4.1	3.8

Source: ABS Publication 8221.0 Manufacturing Industry, Australia

np= not published

## Paper Industry

Data for Table 6.5.a.2 are derived from information provided to the Australian Plantation Products and Paper Industry Council (A3P) by Tasmania's major paper manufacturing companies as part of a paper industry production statistics collection.

**Table 6.5.a.2 Tasmanian paper industry employment**

Year	Employment
2002-03	1,302
2003-04	1,059
2004-05	1,251

Source: A3P, <http://www.a3p.asn.au/facts/index.html> (facts and figures) (2002-03, 2003-04, 2004-05)

A3P states that the fluctuations in employment numbers may be the result of changes in how and what information was recorded.

## Apiary Industry

The 2005 Tasmanian Apiary Industry Profile (FFIC 2005) reported that in 2004, the apiary industry employs a total of 153 people with 60 of these being employed on permanent basis and 93 employed on a part-time or seasonal basis.

## Reserve Management, Tourism and Recreation

Direct employment in reserved forest management includes staff of the Parks and Wildlife Service as well as people employed by the 130 businesses operating in reserves. Indirect employment includes staff of the many tourism businesses operating outside reserves that rely on reserved forests as drawcards for clients as well as people working for suppliers of goods and services. Much of this employment is in rural and regional areas around the state. In 1998/99 it was estimated that between 3,550 and 4,200 positions (see Indicator 6.1.c) or were indirectly created as a result of visitors coming to reserves managed by the Parks and Wildlife Service. This level of indirect employment would have increased significantly since that time in line with the increase in total number of visitors to Tasmania, which grew by over 50 per cent from 531,000 in 2000-01 to 812,000 in 2005-06.

## References

- Australian Bureau of Statistics, Publication 8221.0, *Manufacturing Industry, Australia*
- Australian Paper Products and Paper Industry Council (A3P) (2002-03, 2003-04, 2004-05), <http://www.a3p.asn.au/facts/index.html> (Facts and Figures)
- Felmingham, B.S. (2002). *The Economic Contribution of the Circular Head Wood Centre*, Forestry Tasmania & Symetrics Pty Ltd, Hobart
- Forests and Forest Industry Council (2005). *Tasmanian Apiary Industry Profile*, Forests and Forest Industry Council, Hobart
- Forest and Forest Products Employment Skills Company (2003). *Forest and Wood Products Industry Workforce and Industry Data Collection Survey Report 2002 – 2003*, Forest and Forest Products Employment Skills Company, Sydney.
- Grist, P., Tran, Q.T. and Ball, A. (2000). *Sustainability Indicator 6.3a – Survey of the value of investment in forest industries in Tasmania*. Report by ABARE for Agriculture, Fisheries and Forestry Australia and the Montreal Process Implementation Group
- Commonwealth of Australia and State of Tasmania (2002). *Sustainability Indicators for Tasmanian Forests 1996-2001 in Background Report - Inquiry on the progress with Implementation of the Tasmanian Regional Forest Agreement (1997)*. Resource Planning and Development Commission 2002

## INDICATOR 6.5.b WAGE RATES AND INJURY RATES WITHIN THE FOREST SECTOR

A sustainable industry will ensure high levels of workforce health and welfare and wage rates comparable with national averages for occupations.

### Wage Rates

In the 2002 Sustainability Indicators Report, Tasmania was able to report on salary and wages for the Tasmanian forestry industry. However, it was cited then that the accuracy of the data made any conclusion on trends difficult and that it should be reported on in future reviews. Since the last review, the data specific to the forestry industry are no longer published by the Australian Bureau of Statistics (ABS). The ABS forestry industry employment and manufacturing figures are now aggregated with the fishing and agriculture sectors and cannot be readily separated out.

The ABS labour force survey does provide data on the forestry industry employment, however, the data available are only to the three digit Australian and New Zealand Standard Industrial Classification (ANZSIC) Code level, and only as a national figure. ANZSIC is used for the collection, compilation and publication of statistics by industry and is based on a standard framework of industry classification which groups businesses carrying out similar activities. The labour force survey is an estimate based on a sample survey of households. These surveys are conducted only in urban areas, making this data unreliable in relation to an industry that operates predominantly in regional areas.

However, the ABS publishes data on the manufacturing industry in Australia (Catalogue Number 8221.0). The 2004-05 report indicates that the wood and paper product manufacturing subdivision was ranked the second highest source of both employment, and wages and salaries for manufacturing in Tasmania. Table 6.5.b.1 provides data on employment and wages for the Wood and Paper Manufacturing industry in Tasmania.

**Table 6.5.b.1 Value of wages in the Tasmanian Wood and Paper Product Manufacturing Industry Subdivision (ANZSIC code 23)**

Year	2000-01	2001-02	2002-03	2003-04	2004-05
<b>Wages and salaries (\$ million)</b>	121.2	145.0	163.7	190.0	181.0

Source: ABS Publication 8221.0 Manufacturing Industry, Australia

np= not published

Table 6.5.b.2 contains salary and wage rates for a selected range of employment positions and levels in Tasmania's forest sector that were included in the 2002 Report. Salary levels for these positions over the last five years have increased at an average of approximately 13 per cent over the period excluding the position of Regional Manager. This position was replaced by a higher classified position following a review of management structure and responsibilities.

**Table 6.5.b.2 Salary/wage rates in selected forestry occupations**

#	Award/Position	Wage/Salary (\$ per annum) as at 30 June 2001	Wage/Salary (\$ per annum) as at 30 June 2006	% Change
1	Timber and Allied Industries Award – chainsaw operator Level 3 (maintains own equipment)	23,535	27,227	13.6%
2	Timber and Allied Industries Award – sawmill worker Level 2	22,360	26,052	14.2%
3	Forest Officer Level 9 (Forestry Tasmania Award) (Technical Forester)	40,518	46,449	12.8%
4	Forest Officer Level 22 (Forestry Tasmania Award) (Technical Forester) Senior Manager	66,234	75,699	12.5%
5	Parks and Wildlife Service Agreement 1996 Level 6 (Senior Ranger)	56,127 (includes 31% loading)	64,422 (includes 31% loading)	12.9%
6	Administrative and Clerical Officers Award Level 12 (Parks and Wildlife, Regional Manager)	61,834 (A&COA L10)	80,837 (A&COA L12).	23.5%
7	Administrative and Clerical Officers Award Level 8 (Forest Policy Officer)	54,545	62,607	12.9%

*Source: Forestry Tasmania; the Department of Primary Industries and Water; the Australian Government Department of Employment and Workplace Relations; Department of Infrastructure, Energy and Resources; and the Department of Tourism, Arts and the Environment.*

The position Parks and Wildlife Regional Manager was reported in 2002 as a District Manager (A&COA L10) and following re-evaluation was upgraded to Regional Manager (A&COA L12).

Based on average weekly ordinary time earnings (AWOTE) data in Table 6.5.b.2 shows that the 2000-01 average annual national wage was \$42,059.16. This position was reported in 2002 as a District Manager (A&COA L10). The position was replaced by Regional Manager (A&COA L12) In 2005-06 the average annual wage was \$53,664.40. In comparison, the average Tasmanian annual wage in 2000-01 was \$38,733.76 this was the lowest of all states and territories and below the national average wage level. In 2005-06 Tasmania still has the lowest national wage earnings at \$48,035.00. This represents an increase in the average Tasmanian annual wage of 19.63 per cent compared with the increase in the national average wage over the same period of 21.62 per cent.

**Table 6.5.b.3 State and National AWOTE 2000-06 (\$ per week)**

Year	AWOTE - Tasmania	AWOTE - Australia
2000-01	744.88	808.83
2001-02	778.90	853.63
2002-03	822.68	897.60
2003-04	838.25	941.33
2004-05	882.58	984.73
2005-06	923.75	1,032.00

Source: ABS Publication 6302.0 Average Weekly Earnings, Australia

Based on the data in Table 6.5.b.3, the increase in wages for the forest sector based on the award wages outlined in Table 6.5.b.1, have not kept pace with either the Tasmanian or national average except for #6 in Table 6.5.b.1 which resulted in a 23.5 per cent increase due to a reclassification of the position.

## Injury Rates

WorkCover Tasmania reports the Injury Frequency Rate for Tasmanian industries against the ANZSIC industry codes.

The Injury Frequency Rate (also known as All Claims Frequency Rate) is measured as the number of workers' compensation claims reported in any given year divided by the number of hours worked during the same year multiplied by one million.

The Injury Frequency Rate is calculated using data from WorkCover Tasmania's statistical collection on workers' compensation. As the collection covers only those injuries that result in a claim being lodged by a worker for compensation, the frequency rate of injuries may be underestimated. The number of hours worked is sourced from the Australian Bureau of Statistics.

Table 6.5.b.2 provides data on the Injury Frequency Rate for selected forest industry sectors for the period 2000-01 to 2004-05. Injury rates for 2005-06 were not available for publication in this report. The 2000-01 column was the final period reported in the 2002 Sustainability Indicators Report.

**Table 6.5.b.3 Injury Frequency Rate (number of claims per million hours worked)**

ANZSIC Code	Description of Industry	2000-01	2001-02	2002-03	2003-04	2004-05	% change 2000-2005
030	Forestry and Logging	47.7	61.12	64.40	42.69	30.38	-36.3%
231	Log Sawmilling and Timber Dressing	195.8	171.26	102.48	77.49	105.56	-46.1%
232	Other Wood Product Manufacturing	53.8	29.80	29.34	33.22	43.23	-19.7%
233	Paper and Paper Product Manufacturing	59.3	48.27	61.88	65.38	32.07	-45.9%

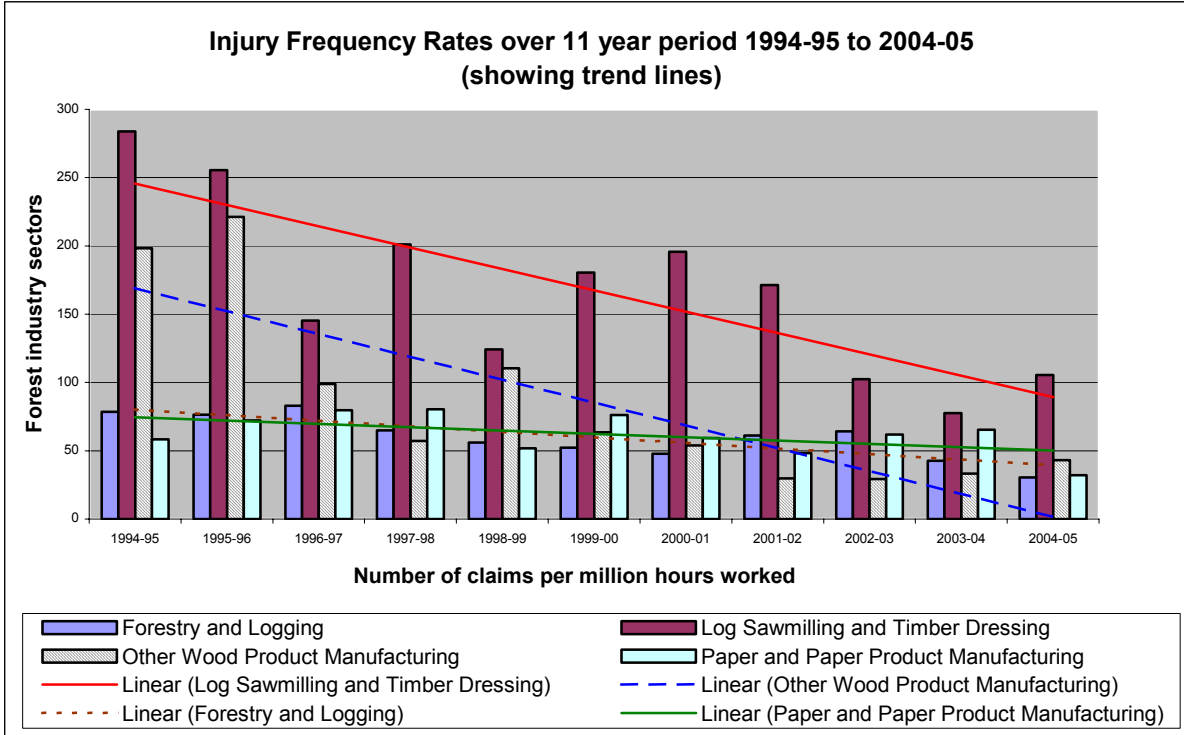
Source: WorkCover Tasmania

The data indicate that the injury frequency rates in the *Forestry and Logging* sector has substantially decreased during the report period from 47.7 claims per million hours worked in 2000-01 to 30.38 in 2004-05, a decrease of 36.3 per cent. The *Log Sawmilling and Timber Dressing* sector also showed a large decrease, from 195.8 in 2001-02 to 105.56 in 2004-05, a decrease of 46.1 per cent.

The injury frequency rate for the *Other Wood Product Manufacturing* sector has increased during the report period but still remains lower than rates prior to 2001-02. The rate for the *Paper and Paper Product Manufacturing* sector has fluctuated over the reporting period but showed improvement in the 2004-05 year resulting in a 45.9 per cent decrease over the period.

The improvements in injury frequency rates may be due to a number of factors including: the emphasis placed on safety management by forestry companies; post-accident investigations leading to improved practices; awareness, promotional and enforcement activities relating to safety management by Workplace Standards Tasmania; and the increasing mechanisation of forest operations.

**Figure 6.5.b.1 Injury Frequency Rate Trends**



Source: WorkCover Tasmania

Figure 6.5.b.1 shows the injury frequency rate over the past 11 years. With the aid of trend-lines it can be seen that the incidence rates for the *Log Sawmilling and Timber Dressing* and the *Other Wood Product Manufacturing* sectors have reduce significantly over the period. Although the reduction has not been as significant for the *Forestry and Logging* and the *Paper and Paper Product Manufacturing* sectors, the trend is showing a continuing reduction over the period.

## Fatality Rates

Fatalities are also measured as an incidence rate, with the rate being expressed as the number of fatalities per million hours worked.

Table 6.5.b.3, shows the fatality frequency rate for the *Forestry and Logging Sector* 2003-04 was 0.30 per million hours worked and 0.27 per million hours worked in 2004-05. The figure in brackets is the actual number of fatalities. Data on 2005-06 fatality rates were not available for publication in this report.

There were two fatalities for each of those years with nil fatalities for the remainder of the reporting period. These fatalities were reported in the *Forestry and Logging* sector only. The shaded 2000-01 column was the final period reported in the 2002 Sustainability Indicators Report.

**Table 6.5.b.4 Fatality Frequency Rate (number of fatalities per million hours worked)**

ANZSIC	Description of Industry	2000-01	2001-02	2002-03	2003-04	2004-05
030	Forestry and Logging	0.23(1)	nil	nil	0.30(2)	0.27(2)
231	Log Sawmilling and Timber Dressing	nil	nil	nil	nil	nil
232	Other Wood Product Manufacturing	nil	nil	nil	nil	nil
233	Paper and Paper Product Manufacturing	nil	nil	nil	nil	nil

Source: *WorkCover Tasmania*

np: not available for publication

Trends in the Fatality Frequency Rate match the declining trend shown in Injury Frequency Rate in the Forestry and Logging Sector. In the 2002 Sustainability Indicators Report, it was reported that there had been one to two fatalities for each of the seven years 1994-2001. In the current reporting period 2001-05 there were two years that were fatality free, and two fatalities in each of the other two years. In the 2002 Sustainability Indicators Report it was also reported that there had been two fatalities reported for the 12 month period of 1996-97 in the Log Sawmilling and Timber Dressing. There have been no fatalities in that sector since that time.

The Other Wood Product Manufacturing and Paper and Paper Product Manufacturing sectors continue to be fatality free.

## References

Australian Bureau of Statistics, Publication 6302.0, *Average Weekly Earnings, Australia*

Australian Bureau of Statistics, Publication 8221.0, *Manufacturing Industry, Australia*

Commonwealth of Australia and State of Tasmania (2002) *Sustainability Indicators for Tasmanian Forests 1996-2001*, in *Background Report - Inquiry on the progress with Implementation of the Tasmanian Regional Forest Agreement (1997)*.

Resource Planning and Development Commission 2002

## **INDICATOR 6.5.c RESILIENCE OF FOREST DEPENDANT COMMUNITIES TO CHANGING SOCIAL AND ECONOMIC CONDITIONS**

This indicator provides a measure of the extent to which communities are able to respond and adapt to change successfully. Communities with a high economic and cultural dependence on forest and forest-related industries should be sustainable into the future.

This is a new indicator that was not reported in the 2002 Sustainability Indicators Report. No data are available to report on this indicator in this report. This indicator will be the subject of a national consultancy with the Bureau of Rural Sciences' Social Sciences Program for the 2007 National State of the Forests Report.

In addition, the Cooperative Research Centre (CRC) for Forestry has recognised that Australia's forest industries are undergoing rapid change, as are the perceptions of different groups about forestry. It has been acknowledged that it is essential to understand the social and economic implications of these industry changes and to develop effective community engagement processes.

To this end the CRC for Forestry has commissioned the Communities Project to be undertaken in Tasmania. The Communities Project will develop an understanding of the social and economic dimensions of forest industries in Tasmania by examining:

1. The socio-economic costs and benefits of different types of commercial forestry;
2. Community attitudes towards commercial forestry, and how these change;
3. Feasible and effective strategies for the forest industry to engage local communities; and
4. Participatory modelling guidelines and tools to inform stakeholder dialogue about trade-offs between production, water, biodiversity, visual amenity and other community requirements.

The Communities Project will provide independent research to improve the understanding of these issues into the future.

The Communities Project is not due to be completed until March 2007. It is expected that the findings of this research project will provide comprehensive information for the 2012 RFA Review.

## **INDICATOR 6.5.d RESILIENCE OF FOREST DEPENDENT INDIGENOUS COMMUNITIES TO CHANGING SOCIAL AND ECONOMIC CONDITIONS**

Indicator 6.5.d provides a measure of the extent to which Indigenous communities are able to respond and adapt to change successfully. Communities with a high economic and cultural dependence on forest and forest-related industries should be sustainable into the future. This indicator should also take into account that the use of forests provides/improves access to resources for survival and the maintenance of traditional values and cultural heritage.

Tasmanian Aboriginal communities are not highly dependent now on forests and/or forest products and/or services and therefore changes to forests will have limited impact on their social and economic status. However, the Tasmanian Government, public agencies and private forest managers recognise the importance of forests and forest sites containing cultural objects and sites of significance to Aboriginal communities and, where practical, engage these communities in management planning and operations.

This is a new indicator developed for use across Australia and as such was not reported against in the 2002 Sustainability Indicator Report.

There are no data to support this indicator in Tasmania.

## **CRITERION 7: LEGAL INSTITUTIONAL AND ECONOMIC FRAMEWORK FOR FOREST CONSERVATION AND SUSTAINABLE MANAGEMENT**

This criterion and associated indicators relate to the overall policy framework that guides and directs the conservation and sustainable management of forests. It includes the broader societal conditions and processes often external to the forest but which support efforts to conserve, maintain or enhance one or more of the conditions, attributes, functions and benefits captured in criteria 1-6.

### **INDICATOR 7.1.a EXTENT TO WHICH THE LEGAL FRAMEWORK SUPPORTS THE CONSERVATION AND SUSTAINABLE MANAGEMENT OF FORESTS**

This indicator reports ongoing continuous improvement in Tasmania's legal framework for forest land ownership and management, including environmental management systems and Indigenous perspectives, ensures transparency and public participation in policy and decision-making processes for the continuous improvement of forest management.

The 1997 Regional Forest Agreement and the 2005 Tasmanian Community Forest Agreement provide the framework and context for forest management in Tasmania. The *Forestry Act 1920* and the *National Parks and Reserves Management Act 2002* are the principal acts that set out the management objectives for State forests and conservation reserves. The *Forest Practices Act 1985* is the legislation under which forest practices are regulated across all tenures. A list of the main legislation relevant to sustainable forest management in Tasmania is provided in Table 7.1.a.1.

**Table 7.1.a.1 Main legislation relevant to Sustainable Forest Management in Tasmania**

<b>Agency</b>	<b>Main legislation</b>	<b>Purpose</b>	<b>Tenures to which legislation applies</b>
Forestry Tasmania	<i>Forestry Act 1920</i>	Empowers Forestry Tasmania with responsibility for exclusive control and management of forest products and forest operations for State forest	State forests
Forest Practices Authority	<i>Forest Practices Act 1985</i>	Establishes the Forest Practices Code and Forest Practices System to provide for the sustainable management of forests on any land subject to forest operations. Provides for the establishment of Private Timber Reserves on private land to provide security of long term forestry use for land owners	All tenures
Department of Tourism, Arts and the Environment	<i>Environmental Management and Pollution Control Act 1994</i>	Establishes duty of care on everyone to prevent or minimise environmental harm. Defines potentially harmful activities requiring assessment and approval Identifies notification requirements for environmental incidents	All tenures

Department of Justice	<i>Land Use Planning and Approvals Act 1993</i>	Establishes the Resource Management and Planning System for Tasmania. Forest practices on State forest, and forest operations on Private Timber Reserves are exempt from the Act	All tenures
Department of Primary Industries and Water	<i>Threatened Species Protection Act 1995</i>	To provide for the conservation management of scheduled threatened species of flora and fauna	All tenures
Department of Tourism, Arts and the Environment	<i>Aboriginal Relics Act 1975</i>	To provide for the identification and protection of all Aboriginal relics (sites)	All tenures
Department of Tourism, Arts and the Environment	<i>Historic Cultural Heritage Act 1995</i>	To identify, assess and protect historic (post settlement) cultural heritage	All tenures
Department of Health and Human Services (Tasmania Fire Service)	<i>Fire Service Act 1979</i>	Provides for the control and use of fire in the urban and rural environment	All tenures
Department of Primary Industries and Water	<i>Crown Lands Act 1976</i>	Makes provisions with respect to the management, sale, and disposal of the lands of the Crown	Crown Lands
Department of Premier and Cabinet	<i>Aboriginal Lands Act 1995 (as amended in 1999)</i>	Promote reconciliation with the Tasmanian Aboriginal community by granting to Aboriginal people certain parcels of land of historic or cultural significance.	All tenures
Private Forests Tasmania	<i>Private Forests Act 1994</i>	Promote the development of private forestry in Tasmania.	Private land
Department of Primary Industries and Water	<i>Forestry Rights Registration Act 1990</i>	Provides for the registration on land title of certain forestry rights.	Any land with title
Forestry Tasmania	<i>Timber Promotion Act 1970</i>	Establishes the Tasmanian Timber Promotion Board to promote the use of wood, in Tasmania.	-
Department of Primary Industries and Water	<i>Regional Forest Agreement (Land Classification) Act 1998</i>	Provides for the new categories of reserves.	-
Resource Planning and Development Commission	<i>Public Land (Administration and Forests) Act 1991</i>	Provides authority to conduct of public land use inquiries.	Public land
Department of Primary Industries and Water	<i>Nature Conservation Act 2002</i>	Provides for the declaration of certain types of reserves and sets out the values and purposes of each reserve class.	All tenures
Department of Tourism, Arts and the Environment	<i>National Parks and Reserves Management Act 2002</i>	Reserves are managed under the <i>National Parks and Reserves Management Act 2002</i> according to management objectives for each reserve class.	Reserves declared under the <i>Nature Conservation Act 2002</i>

Department of Primary Industries and Water	<i>Water Management Act 1999</i>	Management of groundwater and surface water	All tenures
Department of Primary Industries and Water	<i>Weed Management Act 1999</i>	Management of weed control	All tenures
Department of Infrastructure, Energy and Resources	<i>Mineral Resources Development Act 1995</i>	Mineral exploration and fossicking	Private and some types of public land

In addition to the formal legislation, the Tasmanian and Australian Governments have a number of regulatory instruments and policies that support sustainable forest management; these are listed in Table 7.1.a.2.

**Table 7.1.a.2 Main policies relating to forest management and conservation**

<b>Agency</b>	<b>Main policy</b>	<b>Purpose</b>	<b>Tenures to which policy applies</b>
Australian governments	<i>National Forest Policy Statement</i>	Provides a framework for the future management of forests. It has 11 broad national goals	-
Australian and Tasmanian Government	<i>1997 Tasmanian Regional Forest Agreement</i>	Is a legally binding 20 year agreement, with a 5 yearly review period, that applies to all of Tasmania and it provides specific actions which create a balance between the environmental, social, economic and heritage values that forests provide	All tenures
Australian governments	<i>Plantations for Australia: the 2020 Vision</i>	Seeks to enhance regional wealth creation and international competitiveness through a sustainable increase in Australia's plantation resources	-
Australian and Tasmanian Government	<i>2005 Tasmanian Community Forest Agreement</i>	Is a supplement to, and builds on, the RFA by increasing the reserve system and revitalising the timber industry	All tenures
Forest Practices Authority	Permanent Native Forest Estate Policy	Sets threshold levels for the maintenance of a permanent native forest estate by forest communities at both the bioregional and State levels	All tenures
Department of Justice	State policy on the Protection of Agricultural Land 2000	aims to foster sustainable agriculture in Tasmania by ensuring the continued productive capacity of the State's agricultural land resource	Private agricultural lands

The legislation above can be found at: <http://www.thelaw.tas.gov.au/>

The *Forest Practices Act 1985* regulates forest practices on both public and private land in Tasmania and is administered by the Forest Practices Authority (FPA) - an independent statutory authority with responsibilities and powers under the *Forest Practices Act 1985* to ensure that forestry operations comply with the Forest Practices Code.

The Forest Practices Code provides a practical set of guidelines and standards for the protection of natural and cultural values, such as biodiversity, soil and water quality and historic and indigenous heritage, during forest operations.

The legal forest management and conservation framework in Tasmania provides a high level of checks and balances. As well as the regulatory requirements imposed on other land uses, forestry activities must comply with additional standards required under the Forest Practices Code and associated planning tools. On Nature Conservation Reserves there are legislated management objectives for reserve classes, statutory management plans that require formal public consultation, input from the statutory Advisory Council, independent review of public comment by the Resource Planning and Development Commission, adherence to Tasmanian Reserve Management Code of Practice and development applications subject to detailed environmental impact assessment process.

The *Forest Practices Act 1985* includes the provision for Private Timber Reserves, which provide legislative support for a single, consistent, state-wide approach to forest planning and regulation on private land rather than variable regional (developed by Local Councils) schemes approved under the *Land Use Planning and Approvals Act 1993*. At June 2002 377,748 hectares of private property were designated as Private Timber Reserves, which at June 2006 had increased to 421,709 hectares, representing approximately 41 per cent of the total area of private forests within the estate.

The Forest Practices Code covers aspects of environmental care, including biodiversity, geodiversity, visual amenity and the protection of natural and cultural values including soil and water resources. The Code addresses existing and future forest operations on private and public land, including pre-harvest planning, silviculture (including thinning), road construction, plantation establishment and reforestation. Forest Practice Officers monitor all forestry operations in Tasmania from the planning stage through to site restoration. The FPA conducts formal audits to check the standards being met and, where necessary, undertakes corrective action where required.

The scope of the legislation in providing for sustainable forest management is outlined below. Tasmania has adopted the Montreal Process Criteria and Indicators to provide a framework for assessment of current Tasmanian processes. Within this framework used for national State of the Forests reporting a qualitative assessment of each parameter is made in Table 7.1.a.3.

**Table 7.1.a.3 Scope of the ecologically sustainable forest management (ESFM) provisions in legal frameworks**

<b>ESFM aspect. Extent to which the legal framework provides for:</b>	<b>Multiple use forest</b>	<b>Nature conservation reserves</b>	<b>Other Crown land</b>	<b>Private land</b>
<b>Forest management planning and review:</b>				
Accountable management body	Y	Y	Y	N
Dispute resolution process	Y	Y	Y	Y
Forest management planning	Y	Y	Y	Y
Management review	Y	Y	Y	P
Planning for environmental values	Y	Y	Y	Y
Planning review	Y	Y	Y	P
Policy review	Y	Y	Y	P
Property rights	Y	Y	Y	Y
Periodic assessment of forest related resources	Y	Y	Y	Y
<b>Public participation:</b>				
Legislation requires broad based public consultation for forest related policy	Y	Y	Y	Y
Legislation requires broad based public consultation to develop forest related management plans	Y	Y	Y	N
Legislation requires publication of specific forest-related information	Y	Y	Y	Y
Freedom of information legislation allows public access to information related to forests	Y	Y	Y	P
<b>Indigenous participation:</b>				
Formal Indigenous participation in management	P	P	P	P
Indigenous participation in planning	P	P	P	P
Recognition of cultural values	Y	Y	Y	Y
Recognition of Native Title Rights	Y	Y	Y	Y
Has mechanisms to recognise the customary and traditional rights of Indigenous peoples	Y	Y	Y	Y
Traditional management on relevant public land (eg joint management/ co management)	P	P	P	N
Access to forests for traditional activities	P	P	P	N
Access to Indigenous cultural heritage on forest land	P	P	P	N

Allows for the performance of traditional practices	P	P	P	N
Allows for the protection of Indigenous intellectual property	P	P	P	P
<b>Other aspects</b>				
Recognition of scientific values	Y	Y	Y	P
Recognition of voluntary reserves on private land	NA	NA	NA	Y
Regulation of forest clearing	Y	Y	Y	Y
Resource assessment	Y	Y	Y	P
Secure land tenure	Y	Y	Y	Y
SFM an explicit objective	Y	Y	Y	P

**Ratings:**

**Y** = Yes. The legal framework exists with ESFM provisions that are fairly comprehensive;

**P** = Partly. The legal framework or mechanism exists but does not cover all ESFM aspects or is limited in its application;

**N** = No. The legal framework does not exist or include ESFM provisions.

**NA** = Not applicable

<sup>1</sup>. Access includes an ability to enter and undertake activities such as foraging, hunting, or ceremonial.

Based on data in Table 7.1.a.3, the framework for ecologically sustainable forest management has been established at a high level for public land. The framework for private land is also comprehensive, but slightly less than for public land. Larger industrial privately managed forests have established systems which ensure compliance with legislation as an integral management objective specified under independently certified ISO and EMS standards. However, these systems have not necessarily been adopted by smaller private forest managers.

The existence or otherwise of legislative requirements to apply best practice for a range of activities in a way that provides for sustainable forest management are summarised in Table 7.1.a.4. Even though there have some legislative improvements during the reporting period the ratings in the table show no change between 2001-02 and 2005-06.

**Table 7.1.a.4 Legislative requirement to apply best practice for sustainable forest management activities by tenure category**

Activities	Multiple use forest		Nature conservation reserve		Other Crown land		Private land	
	2001-02	2005-06	2001-02	2005-06	2001-02	2005-06	2001-02	2005-06
<b>Access to the forest</b>								
Planning and siting roads	Y	Y	Y	Y	Y	Y	Y	Y
Road design and construction	Y	Y	Y	Y	Y	Y	Y	Y
Upgrading existing roads and tracks	Y	Y	Y	Y	Y	Y	Y	Y
Rock quarries and gravel pits	Y	Y	Y	Y	Y	Y	Y	Y

	Multiple use forest		Nature conservation reserve		Other Crown land		Private land	
	2001-02	2005-06	2001-02	2005-06	2001-02	2005-06	2001-02	2005-06
<b>Activities</b>								
Bridge, causeway and ford construction	Y	Y	Y	Y	Y	Y	Y	Y
Road maintenance	Y	Y	Y	Y	Y	Y	P	P
<b>Harvesting</b>								
Design, planning and equipment	Y	Y	NA	NA	Y	Y	Y	Y
Wet weather	Y	Y	NA	NA	Y	Y	Y	Y
Snig tracks and landings	Y	Y	NA	NA	Y	Y	Y	Y
Water quality and stream protection	Y	Y	NA	NA	Y	Y	Y	Y
Salvage operations	Y	Y	NA	NA	Y	Y	Y	Y
Steep country	Y	Y	NA	NA	Y	Y	Y	Y
Timber harvesting plans	Y	Y	NA	NA	Y	Y	Y	Y
<b>Conservation of other values</b>								
Flora	Y	Y	Y	Y	Y	Y	Y	Y
Fauna	Y	Y	Y	Y	Y	Y	Y	Y
Rare or endangered species	Y	Y	Y	Y	Y	Y	Y	Y
Landscape	Y	Y	Y	Y	Y	Y	Y	Y
Archaeology (cultural heritage)	Y	Y	Y	Y	Y	Y	Y	Y
Geomorphology	Y	Y	Y	Y	Y	Y	Y	Y
Care of soils	Y	Y	Y	Y	Y	Y	Y	Y
Water quality and flow	Y	Y	Y	Y	Y	Y	Y	Y
<b>Forest establishment</b>								
Reforestation	Y	Y	NA	NA	Y	Y	Y	Y
<b>Maintaining forests</b>								
Fire management	Y	Y	Y	Y	Y	Y	P	P
Pest, disease, weed control	Y	Y	Y	Y	Y	Y	N	N
Use of chemicals	Y	Y	Y	Y	Y	Y	Y	Y
Thinning	Y	Y	NA	NA	Y	Y	Y	Y
<b>Non-wood products / uses</b>								
Apiary	Y	Y	Y	Y	Y	Y	N	N
Grazing	Y	Y	Y	Y	Y	Y	N	N
Recreation	Y	Y	Y	Y	Y	Y	N	N

Activities	Multiple use forest		Nature conservation reserve		Other Crown land		Private land	
	2001-02	2005-06	2001-02	2005-06	2001-02	2005-06	2001-02	2005-06
<b>Socio-economic</b>								
Occupational health and safety	Y	Y	Y	Y	Y	Y	Y	Y

#### Rating

**Y** = Yes. There is a legislative requirement to apply best practice for this activity in this tenure category

**P** = Partly. There is a legislative requirement to apply best practice for this activity in this tenure but this requirement does not cover all aspects or is limited in its application.

**N** = No. There is no legislative requirement to apply best practice for this activity in this tenure.

**NA** = Not applicable

During the five years to June 2006 the principal changes to the legislative and policy framework supporting forest management have been:

- An upgrading of legislation for reserve declaration (*Nature Conservation Act 2002*) and reserve management (*National Parks and Reserves Management Act 2002*) in 2002;
- Amendments to the *Forest Practices Act 1985* to ensure greater independence of the Forest Practices Authority and to provide for improved transparency in its operation;
- The development of the Tasmanian Community Forest Agreement in 2005 which increased the area of forest under conservation management and provided support to the timber industry in their progressive transition to dependence on smaller sawlogs from regrowth forest and plantations;
- The revision of the Policy on Maintenance of a Permanent Native Forest Estate in 2005 which resulted in higher retention levels being set for the maintenance of the permanent native forest estate; and
- The formal listing of threatened forest communities within the *Forest Practices Regulations 1997*.

#### Reference

Forest Practices Authority (2006) *Annual Report on Forest Practices 2005-2006*, Forest Practices Authority, Hobart

## **INDICATOR 7.1.b EXTENT TO WHICH THE INSTITUTIONAL FRAMEWORK SUPPORTS THE CONSERVATION AND SUSTAINABLE MANAGEMENT OF FORESTS**

This indicator reports the extent to which the institutional framework supports the conservation and sustainable management of forests. It specifically looks at Tasmania's commitment to building community awareness, regional assessment and planning, and includes policy review as an essential basis for continuous improvement of sustainable management of forests. The maintenance of appropriate levels of human resource skills, the enforcement of laws, regulations and guidelines and the adoption of forest certification are mechanisms that can be utilised in demonstrating commitment to sustainable forest management.

This indicator was reported as Indicator 7.2 in the 2002 Sustainability Indicators Report.

The requirement to develop and maintain essential skills is recognised by Tasmania's forest managers as underpinning the planning and operational systems necessary to support sustainable systems and practices. These skills include relevant tertiary and technical training in forest practices, operational competencies, safety, fire management and visitor services.

Ongoing support for continuing development of existing and new employees' skills is promoted through formal and informal training opportunities across a wide range of disciplines. Opportunities are developed through Tasmania's public educational institutes (University of Tasmania and TAFE Tasmania), training organisations (such as ForestWorks) and informally by presentations and workshops (such as Forestry Tasmania's 'lunch time talks' and the Forest Practices Authority's (FPA) courses) and promoted by forest owners, managers, researchers and regulators.

The formal and informal systems ensure that all forest managers have access to develop and maintain the skills and expertise in environmental management necessary to plan and implement best forestry practices in Tasmania.

The development of management plans for public forests are subject to periodic review, while public policies and targeted programs by governments at the state and national level actively support the development and implementation of plans on private land (eg Natural Resources Management programs, the Department of Primary Industries and Water (DPIW) and Private Forests Tasmania). Table 7.1.b.1 lists major public non-legislative policies under which forest management activities are undertaken on public land, and where appropriate, private lands.

**Table 7.1.b.1 Major institutions or organisations which manage forests, and their responsibilities, major policies and operating budget**

Name of organisation	Responsibilities for forests (and tenure)	Major non-legislative policies relevant to the organisation	Total operating budget of the organisation
<b>Private land</b>			
Gunns Limited	Forests managed by Gunns Limited	Gunns Forest Management Statement Gunns Sustainable Forest Management Policy Gunns Environmental Policy Gunns Permanent Native Forest Estate Policy	NA
Forest Enterprises Australia	Forests managed by FEA	Environmental Policy Statement	NA
Norske Skog	Forests managed by Norske Skog	Environmental policy	NA
<b>Public land</b>			
Forestry Tasmania	State forests - Multiple use forest and reserves	Sustainable Forest Management Policy District Forest Management Plans Occupational Health and Safety Policy Giant Tree Policy Rainforest Policy Huon Pine Policy King Billy Pine Policy Aerial Application of Chemicals Policy Water Sampling Policy Landscape Management Policy	Expenses \$157 million Revenue \$176 million Earnings before interest and tax \$19.9 million (for 2005-06)
Department of Tourism, Arts and the Environment (Parks and Wildlife)	National Parks and reserves (including the Tasmanian Wilderness World Heritage Area)	Tasmanian Reserve Management Code of Practice, 2003 Management Plans for national parks and major reserves	Recurrent funding \$20 million

The *Tasmanian World Heritage Area Management Plan 1999* was awarded the 2003 Planning Institute of Australia's state and national Award of Excellence in the category for Environmental Planning/Conservation. This plan also received the Planning Minister's Award as overall winner across all categories of the 2003 national awards for planning excellence.

State agencies primarily responsible for public forest management in Tasmania are Forestry Tasmania and the Department of Tourism, Arts and the Environment (DTAE). These public agencies have well developed policies and systems which have been prepared or revised since 2002 to incorporate the 2005 Tasmanian Community Forest Agreement

outcomes. The Forest Practices Authority has also developed prescriptions and systems that reflect changes under the 2005 Agreement and apply to all forest activities undertaken under the *Forest Practices Act 1985*. This Act promotes a co-regulatory approach to forest management, involving self-regulation by the industry with independent monitoring and enforcement carried out by government agencies.

Government agencies with legislative authority to undertake investigate and measure compliance against legal instruments include the:

- FPA which undertakes annual auditing of Forest Practices Plans and also investigates all potential breaches under the *Forest Practices Act 1985*. It has the authority to apply sanctions where breaches of the Forest Practices Code and the Plan have been identified. Investigations can be carried out by a Forest Practices Officer, of which in 2006 there were 198 officers accredited with the Authority;
- DPIW which has five (2006) trained Enforcement and Compliance Officers to ensure compliance with its Acts and Regulations; and
- DTAE which employs around 68 (2006) full time and seasonal staff whose responsibilities include investigation of illegal activities in reserves.

The *Forest Practices Code* provides a framework under which all forest practices are conducted in accordance with the *Forest Practices Act 1985*. The Code provides a legally enforceable and practical set of guidelines and standards for the reasonable protection of environmental values, which include flora, fauna, geomorphology, soils, cultural heritage, visual landscape, silviculture and fire management, during forest operations. The Code applies to forest practices on all tenures for all harvesting, roading and reforestation activities. Forestry activities must also take account other legislation and policies: ie forestry activities must be carried out in a consistent manner which meets the regulatory requirements imposed on other land managers, as well as those standards established under the Code, supported by planning manuals and technical guidelines, developed by FPA specialists and directives issued by the Chief Forest Practices Officer. All documents are supported by continuing research and review. Certificates of Compliance (further information is provided later in the section on Compliance) must also be lodged with the FPA upon completed implementation of plans.

Table 7.1.b.2 indicates the extent sustainable forest management provisions are integrated within non-legislative policy frameworks on private and public lands. Overall, there is a large commitment to integrating such policies irrespective of land tenure. However, there are differences which reflect management objectives and practical issues relating to such management. The variability of integration of such policies as applied on private forest land reflects the spectrum of forest management systems employed on such lands: ranging from high for land managed by large industrial to low for small, independent managers.

**Table 7.1.b.2 Extent of the sustainable forest management provisions in non-legislative policy frameworks**

<b>Extent to which the non-legislative policy framework provides for:</b>	<b>Multiple use forest</b>	<b>Nature conservation reserves</b>	<b>Other Crown land</b>	<b>Private</b>
<b>Forest management planning and review</b>				
Accountable management body	Y	Y	P	P
Dispute resolution process	Y	Y	Y	P
Forest management planning	Y	Y	Y	P
Management review	Y	Y	Y	P
Planning for environmental values	Y	Y	Y	P
Planning review	Y	Y	Y	N
Policy review	Y	Y	Y	Y
Property rights	Y	Y	Y	Y
Periodic assessment of forest related resources	Y	Y	Y	P
<b>Public participation</b>				
Broad based public consultation for forest related policy	Y	Y	Y	Y
Broad based public consultation to develop forest related management plans	P	Y	P	N
Publication of specific forest-related information	Y	Y	Y	P
Allows public access to information related to forests	P	Y	P	P
<b>Indigenous participation</b>				
Indigenous participation in management	N	P	P	N
Indigenous participation in planning	N	P	P	N
Recognises cultural values	Y	Y	Y	P
Recognises native title rights	P	P	P	P
Recognises the customary and traditional rights of Indigenous peoples	Y	Y	Y	P
Allows traditional management on relevant public land (eg joint management/ co management)	N	P	P	N
Allows access <sup>1</sup> for traditional activities	Y	P	P	N
Allows access to Indigenous cultural heritage	Y	Y	P	P
Allows the performance of traditional practices	P	P	P	N
Allows for the protection of Indigenous intellectual property	-	Y	-	-
<b>Other aspects</b>				
Recognition of scientific values	Y	Y	Y	P
Recognition of voluntary reserves on private land	-	-	-	Y
Regulation of forest clearing	Y	Y	Y	P
Resource assessment	Y	Y	P	P
Secure land tenure	Y	Y	-	Y
SFM an explicit objective	Y	Y	P	P

**Ratings:**

**Y** = Yes. This aspect of sustainable forest management (SFM) is covered fairly comprehensively by policies in this tenure;

**P** = Partly. This aspect of SFM is only partially covered (or has limited application) by policies in this tenure;

**N** = No. This aspect of SFM is not covered by policies in this tenure.

<sup>1</sup>. Access includes an ability to enter and undertake activities such as foraging, hunting, or ceremonial.

In 2003 a Tasmanian Reserve Management Code of Practice 2003 was adopted for use in reserve management by Forestry Tasmania and the Parks and Wildlife Service. Whilst not a statutory document the Code provides standards and guidelines for environmental management that are consistent with the Forest Practices Code.

Larger private industrial companies have also developed sophisticated environmental management systems (as per Table 7.1.b.1) that are consistent with the 1997 Tasmanian Regional Forest Agreement and the 2005 Tasmanian Community Forest Agreement.

Ensuring the community is informed about, and engaged in, public forest management decisions is fundamental to effective institutional forest management and conservation systems.

An overarching public policy guideline is the Tasmania *Together* process, which was established in 2001 and identifies the community's views of Tasmania's long-term inspirational social, economic and environmental goals. Tasmania *Together* is used by the Tasmanian Government to guide decision-making in the government, business and community sectors. Progress towards the achievement of the goals and benchmarks is monitored by an independent statutory authority, the Tasmania *Together* Progress Board, and results are reported to all Tasmanians through the Parliament.

Tasmania *Together* was reviewed in 2006 with extensive community consultation undertaken. The Board presented its Five Year Review Report and recommendations to the Tasmanian Parliament at the end of 2006.

Community involvement in private forest management (as defined under the *Forest Practices Act 1985*) is mandatory under Section A3.2 of the *Forest Practices Code 2000*. In addition, provisions under the Australian Forestry Standard provide for community consultation and are a requirement under the accreditation process. Table 7.1.b.3 provides a summary of the area (hectares) for which management plans have been developed and in which cross-sectional involvement occurs during the development of the plans.

**Table 7.1.b.3 Area of forested land under local and regional management plans, cross-sectoral involvement.** (Note the areas are land area not forest)

Forest Manager	Area under management plan (hectares)	Does cross-sectoral involvement occur in the development of the plan?	What is the review period for the management plan	Is the plan integrated with other aspects of resource planning?
Forestry Tasmania	1.5 million	yes	10 years	yes
Parks and Wildlife	1.7 million	yes	5-10 years	yes
Private industrial forest managers	0.2 million	yes	2 years	yes
Private non-industrial forest owners	Unknown	N/A	N/A	N/A

Further information on government agency initiatives which support community participation on forest management and conservation planning is at Appendix 7.1.b.

## ENFORCE LAWS, REGULATIONS AND GUIDELINES

Table 7.1.b.4 provides an overview of the monitoring and compliance systems in place across tenures. The number of monitoring and compliance activities carried out annually over the reporting period 2001 to 2006 is not readily available. Reporting for this Indicator is provided by the FPA, PWS and the DPIW, who are primarily responsible for enforcement of relevant forest legislation and policies. The PWS have responsibility for monitoring and compliance on Crown land as well as most nature conservation reserves.

**Table 7.1.b.4 Monitoring and compliance systems in place**

	Rating of monitoring and compliance systems			
	Multiple use forest	Nature conservation reserves	Private land	Other Crown land
Arson	P	P	P	P
Animals (bringing into areas where they are not allowed)	N	P	N	P
Behaviour	P	P	N	P
Camping (in unauthorized areas)	P	P	N	P
Clearing	P	P	P	P
Fee avoidance	N	P	N	P
Land clearing	P	P	F	P
Resource protection (dumping rubbish, soil disturbance, fires)	P	P	N	P
Signage (damaging signs)	P	P	P	P
Theft of forest produce (firewood, fence posts etc)	P	P	P	P
Vehicle (accessing unauthorized areas)	P	P	P	P

Rating: F = Fully effective

P = Partly effective, some improvements can be made and enforcement not done.

N = Not in place

## FOREST PRACTICES AUTHORITY

### *Monitoring of compliance*

#### **General**

Under the regulatory framework established through the *Forest Practices Act 1985*, the forest industry has a responsibility to adequately supervise and monitor its forestry operations to ensure compliance.

The FPA accredits Forest Practices Officers (FPOs) who have legislative authority under the *Forest Practices Act 1985* to undertake compliance and enforcement activities across all tenures where forest activities are contrary to the Act or the Forest Practices Code 2000. Consistent with the co-regulatory approach, FPOs include employees of private companies and public agencies, private contractors and self employed individuals.

There were 198 Forest Practices Officers (FPOs) accredited in 2005-06 (Table 7.1.b.5) who supervise and monitor forestry operations to ensure that they comply with the *Forest Practices Act 1985*. This is a slight increase in the number of FPOs since 2002.

**Table 7.1.b.5 Number of FPOs authorised to undertake compliance and enforcement activities**

Financial Year	Number of authorised Forest Practices Officers
2001-02	193
2002-03	184
2003-04	180
2004-05	187
2005-06	198

In addition to the systems implemented by the FPA, larger forest managers undertake formal auditing and/or informal in-house monitoring, often as part of environmental management systems consistent with standards such as ISO 14001. Formal reporting on compliance is required upon the completion of all Forest Practices Plans (FPPs) under s.25A of the *Forest Practices Act 1985*. Independent monitoring is carried out by:

- an independent audit of a representative sample of all FPPs by the FPA;
- audits of Private Timber Reserves by the FPA;
- staff of the FPA in the course of routine inspections, assessments of the standard of FPOs, and investigations arising from complaints and alleged breaches of the Forest Practices Code 2000; and
- monitoring of natural and cultural values by the FPA's specialist staff.

#### **Compliance**

Compliance with the *Forest Practices Act 1985* is monitored by the FPA using two mutually supportive, but independent systems:

- Certificate of Compliance; and

- the Annual Audit program.

Changes to the *Forest Practices Act 1985* implemented from 1 July 1999 introduced a requirement for a Certificate of Compliance to be lodged with the FPA within 30 days of the completion of operations prescribed within a FPP. Certificate of Compliance reporting began in 2001-02. Reports provide evidence that an FPP:

- fully complied with all provisions of the plan; or
- did not fully comply with:
  - no further action required – this generally involves a change in the operation such as a reduction in the actual harvest area. Such changes are noted and amendments are made to the FPP database.
  - the matter was resolved through corrective action – this generally means that the FPO undertaking the final compliance check has detected non-compliance and has issued a notice under the Forest Practices Act to require corrective action to ensure compliance with the plan.
  - further action required – this generally involves a non-compliance issue that requires further investigation and action by the FPA.

Changes to the *Forest Practices Act 1985* implemented from 1 July 2005 require reports on compliance to be lodged within 30 days of the completion of each discrete operational phase within the FPP. Discrete operational phases include activities such as road construction, harvesting and reforestation.

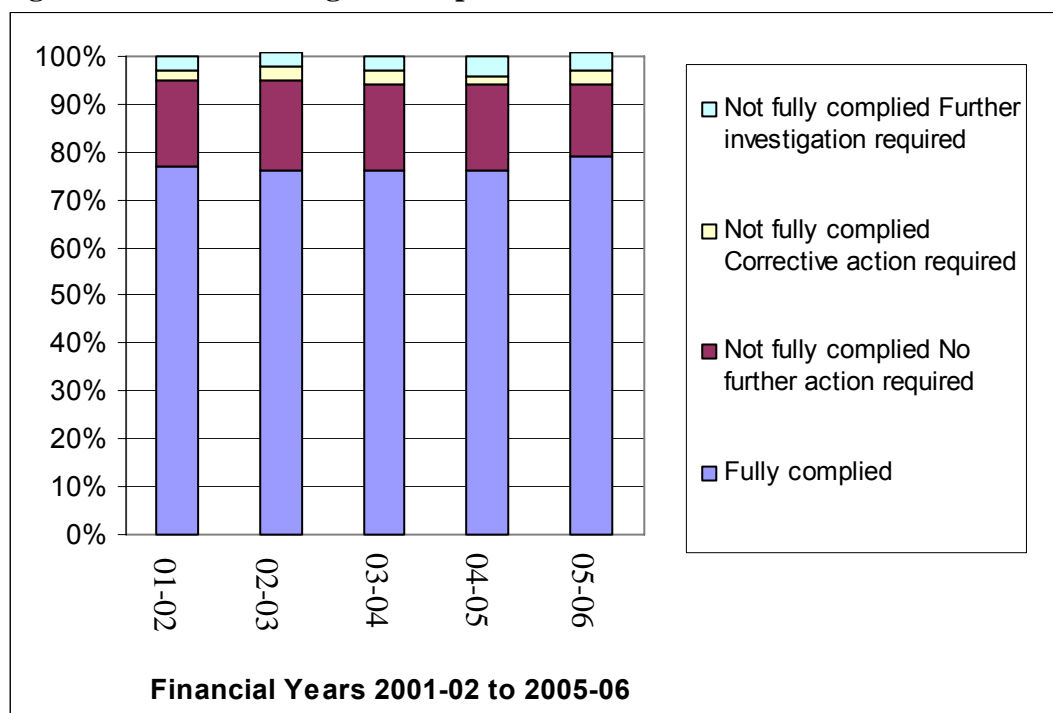
The number of Certificates of Compliance lodged since its introduction in 2001-02 (Table 7.1.b.6, Figure 7.1.b.1) has increased nearly 50 per cent per year. Generally, the level of compliance has been high, with, on average, 94 per cent of operations not requiring a corrective action to be taken. However, there has been no improvement in the lodgement of compliance reports since the legislative requirements came into effect and the level of lodgement continues to be less than acceptable. This situation reflects a low level of lodgement by private, individual forest owners, and implementation issues.

The 2005 changes to the *Forest Practices Act 1985* also gave the FPA more effective powers, including the issue of notices and fines, to ensure that a satisfactory level of compliance reporting is achieved by all sectors of the industry. Improvements are expected to be reported in the next Sustainability Indicators Report due in 2012.

**Table 7.1.b.6 Certificates of compliance lodged with the Forest Practices Authority**

Year	Certificates due	Certificates lodged	Compliance (for certificates lodged)			
			Fully complied	Not fully complied		
				No further action required	Corrective action required	Further investigation required
2005-06	3432	2490	1907	460	53	71
		73%	77%	18%	2%	3%
2004-05	2529	1906	1446	356	48	56
		75%	76%	19%	3%	3%
2003-04	2128	1655	1257	298	43	55
		78%	76%	18%	3%	3%
2002-03	1416	1111	840	203	26	42
		78%	76%	18%	2%	4%
2001-02	755	637	502	93	19	23
		84%	79%	15%	3%	4%

**Figure 7.1.b.1 Percentage of compliance 2001-02 to 2005-06**



### Independent audit of forest activities

The FPA undertakes an annual audit program covering a representative sample of certified FPPs, selected by stratified random sample to incorporate all aspects of forest planning and operational practices undertaken by companies and agencies, and individual forest owners or managers.

The audit program provides an independent and objective instrument, which identifies where further improvements can be made to ensure forest planning and operations meet the objectives of the *Forest Practices Act 1985* and the *Forest Practices Code 2000*.

In 2005-06, 103 audits were undertaken which found that continued improvement in planning and operational performance is being achieved, and, on average, forest planning and operational practices for all categories across all tenures met or exceeded the minimal performance rating.

A comparison of audits from 2003-04 to 2005-06 provides consistent comparison of the performance rating achieved by tenure from 2003-04 to 2005-06 and is presented in Table 7.1.b.7. A “Sound” rating is considered by the Forest Practices Authority as the minimal standard required to meet the objectives of the *Forest Practices Act 1985* and the *Forest Practices Code 2000*.

Table 7.1.b.7 indicates that over the last three years, continued improvement in planning and operational performance is being achieved, and, on average, 91.2 per cent forest planning and operational practices of all forest operations across all tenures meet or exceed the required minimum standards.

**Table 7.1.b.7 Percentage of performance rating achieved by tenure 2003-04 to 2005-06**

Standard	Year	Industrial private forest	Independent private forest	State forest	Total Average	3 Year Average
<b>Unacceptable</b>	2003-04	1.2	6.0	1.2	2.8	
	2004-05	2.3	3.6	1.0	2.3	2.7
	2005-06	2.6	5.9	1.4	3.3	
<b>Below Sound</b>	2003-04	3.3	2.0	4.2	3.2	
	2004-05	7.8	13.2	7.4	9.5	6.1
	2005-06	4.6	9.8	3.3	5.9	
<b>Sound</b>	2003-04	5.5	3.2	9.3	6.0	
	2004-05	27.4	36.6	27.1	30.4	15.5
	2005-06	7.4	12.7	9.9	10.0	
<b>Above Sound</b>	2003-04	2.2	-	3.2	2.7	
	2004-05	34.6	24.0	33.9	30.8	15.2
	2005-06	12.4	11.5	12.8	12.2	
<b>High</b>	2003-04	87.9	88.8	82.1	86.3	
	2004-05	27.9	22.6	30.6	27.0	60.5
	2005-06	73.0	60.1	72.6	68.6	

All forest managers undertake informal, in-house audit programs to assess standards achieved throughout, and following forest operations. Independent formal audits are also undertaken by Forestry Tasmania and Gunns Limited to meet Australian Forestry Standard and ISO 14001 accreditation standards. Audits include assessment of the organisations compliance with legislative requirements. Audit results are not publicly available, but are reported under public Environmental Management System annual reports.

## Enforcement

Under the principle of self-regulation that applies under the *Forest Practices Act 1985*, all parties have a responsibility to respond to complaints, with the FPA investigating all complaints relating to alleged breaches or poor practice. Formal legal investigations by the FPA, in consultation with the Director of Public Prosecutions, are undertaken into serious breaches.

The forest practices system is designed to achieve high environmental standards, with an emphasis on planning, training and education. Where problems arise, the FPA expects that they will be dealt with through early detection and corrective action. Corrective action may mean remedial treatment in the forest. Most importantly, it also means reviewing and improving systems to ensure that similar failures do not arise in the future. From time to time, a failure occurs that generally reflects inadequate systems or insufficient care. In these cases, penalties are appropriate to reinforce the importance of all parties striving for full compliance with the requirements of the *Forest Practices Act 1985*.

Legal enforcement may be taken in several ways:

- FPOs may give verbal or written notification in order to inform persons that they must comply with the *Forest Practices Act 1985* or an FPP. Failure to comply with the second notice may lead to prosecution;
- The FPA may prosecute for failure to have operations covered by an FPP, for failing to comply with an FPP or for failing to lodge a certificate of compliance; or
- The FPA may impose fines as an alternative to prosecution.

Table 7.1.b.8 shows the number of formal investigations undertaken by the FPA since 1995/96. The level of investigations and actions reflect annual trends and cannot be taken to indicate the effectiveness of the system.

In most cases, the FPA found that the majority of breaches could be attributed to human error or lack of knowledge about the requirements of the forest practices system. Most breaches were dealt with by corrective actions, in accordance with the philosophy of the *Forest Practices Act 1985* to 'make good' and to effect improvement. In comparing the percentage of major breaches on an annual basis there does appear to be an overall reduction leading to the imposition of penalties and/or legal action which reflects a greater awareness of the legal obligations which apply to all land managers undertaking forest operations.

**Table 7.1.b.8 Number of investigations undertaken by the Forest Practices Authority  
1995-06 to 2005-06**

Year	Total number formal investigations	Investigated and no breaches identified	Number of minor breaches	Number of major breaches
1995-06	82	23	19	40
1996-97	140	29	48	63
1997-98	80	16	34	30
1998-99	74	21	23	30
1999-00	77	33	40	4
2000-01	83	34	39	10
2001-02	58	21	30	7
2002-03	90	28	46	16
2003-04	128	39	57	32
2004-05	136	42	64	30
2005-06	93	36	38	19

**Note:** Minor breaches include notices to rectify and warnings, but no further action. Major breaches include penalties, legal action and breaches where no action was pursued due to insufficient evidence and/or legislative time constraints.

## CONSERVATION RESERVES

The Parks and Wildlife Service (PWS) manage a reserved land estate of over 440 reserves covering approximately 36 per cent of Tasmania. Over half the area of the reserve system lies within the Tasmanian Wilderness World Heritage Area, one of the largest conservation reserves in Australia (1.38 million hectares) covering approximately 20 per cent of the land area of Tasmania and one of only three temperate wilderness areas remaining in the Southern Hemisphere.

The key objective of the PWS is to manage the State's representative and world renowned reserve system to achieve the principal goal of conserving the State's natural and cultural heritage while providing for sustainable use and economic opportunities for the Tasmanian community.

The PWS *Strategic Plan 2006-08* was developed in February 2006 to provide a dynamic framework to enable the Parks and Wildlife Service to respond more effectively to the community's needs and aspirations for the reserve system.

Since transferring from the former Department of Primary Industries, Water and Environment in 2002, the PWS has undergone restructuring to form three operational regions – Northwest, North and South – to provide the main conservation and visitor services with improved alignment with local government, other agencies and the NRM regions. Research in the Tasmanian community has revealed high levels of awareness and recognition of the value of reserves to the community, as well as high levels of use of national parks.

Improved management, especially of assets in reserves is being made possible through the development of an asset management framework and information management system for the PWS. Also, the internal environmental impact assessment process has been upgraded and is resulting in more rigorous assessment of impacts on reserve values of new activities and appropriate action to avoid or mitigate any undesirable impacts. A significant focus has been on public risk assessment and hazard signage for key sites.

A major program of new and upgraded visitor facilities has been undertaken and is ongoing, particularly in the high use areas.

Significant changes have been made to management of the Overland Track, Tasmania's premier bushwalk. Significant issues of crowding, overuse and run down facilities have been addressed. Visitors' experience and environmental standards have been improved through the introduction of a web-based booking system, upgraded infrastructure and services and a user-pays system to assist in funding necessary facilities. The system is working well with good user support.

Several key advisory groups continue to provide regular and informed community input to reserve management – the National Parks and Wildlife Advisory Committee, the World Heritage Area Consultative Committee and the Arthur Pieman Advisory Committee. Consultation and liaison with a wide range of local communities and interest groups continues across the State.

Enforcement of acts and regulations in reserves is primarily conducted by the 78 Rangers in the PWS who work in field centres around the State. The Wildlife Operations Unit of the DPIW monitors all compliance and enforcement matters for the Parks and Wildlife Service, including major breaches of the *National Parks and Reserves Management Act 2002* (and its predecessor the *National Parks and Wildlife Act 1970*). Table 7.1.b.9 indicates the amount of enforcement work undertaken by PWS and DPIW field staff.

Of the prosecutions under the *National Parks and Reserves Management Act 2002*, four were for taking timber from a reserve. Of the infringement notices issued, approximately 70 per cent are for failing to pay or display a valid park pass or receipt. The next significant offence type is vehicles travelling off formed roads, including motorbikes, followed by dogs on reserved land and then firewood collection and possession and use of chainsaws on reserved land. The high number of infringement notices issued in 2003-04 reflects an emphasis on enforcement of park pass regulations in that year and the data for following years partly reflects a decline in enforcement effort in this area.

**Table 7.1.b.9 Cautions and Notices issued by PWS and DPIW field officers during period 2001-02 to 2005-06**

<b>LEGISLATION</b>	<b>2001-02</b>	<b>2002-03</b>	<b>2003-04</b>	<b>2004-05</b>	<b>2005-06</b>
<b><i>National Parks and Wildlife Act 1970</i></b>					
Verbal Cautions	1	2			
Formal Cautions	1				
Prosecutions	1				
<b><i>National Parks and Reserves Management Act 2002</i></b>					
Verbal Cautions					
Formal Cautions	1	2			
Prosecutions		1	3		
<b><i>National Parks and Reserved Land Regulations 1999</i></b>					
Verbal Cautions	25	61	80	37	22
Formal Cautions	10	21	25	8	1
Infringement Notices	84	82	194	69	36
Prosecutions	12	16	18	14	4
<b><i>Crown Lands Act 1976</i></b>					
Verbal Cautions	7	4	1	1	
Formal Cautions	2	4	4		1
Prosecutions			1		
<b><i>Crown Lands Regulations 2001</i></b>					
Verbal Cautions	3				
Formal Cautions			2		
Prosecutions	1	6		1	

## **CERTIFICATION**

Within developed economies, there is an increased tendency to include production aspects on labels of products such as animal welfare, labour circumstances, environmental impact etc. To date, market forces, not government intervention, has been the principal driver for the adoption of such standards.

Certification schemes are based on principles, criteria, and standards that encompass economic, social, and environmental measures. They are not on-the-ground prescriptions although they influence management decisions.

As a natural renewable resource user, Tasmanian forest managers are leaders in ecologically sustainable development. All of Tasmania's public State forests, and the majority of private industrial forests, are now certified under at least one of a number of voluntary systems which recognise environmental, economic, social and cultural forest management performance and sustainability in the forest industry.

Increasingly in an internationally competitive trading environment, certification provides assurance to purchasers of wood and paper products that they are promoting sustainable forest management. The majority of Tasmania's commercial forests are able to demonstrate their sustainable management credentials through independent certification under national and international standards such as the Australian Forestry Standard and the International Standards for Environment Management Systems (ISO 14001). Public reserves managed under the *National Parks and Reserve Management Act 2002* are not currently covered by an environmental management system (EMS). The PWS is making progress with the development of an EMS with review and upgrading of the PWS environmental impact assessment process – the Reserve Activity Assessment System (RAA). The RAA system has been developed to meet the requirements of the Tasmanian Reserve Management Code of Practice.

The Australian Forestry Standard (AFS) is also recognised internationally by the Programme for the Endorsement of Forest Certification Scheme, the world's largest forest certification body. The AFS is based on ISO 14001 and the Montreal Process Criteria, and is compatible with other international certification schemes.

These certification schemes have been developed over the last five years, with 1.7 million hectares certified in Tasmania under the AFS (Table 7.1.b.10). AFS certification has been obtained by Forestry Tasmania and Gunns Limited. Four companies (Forestry Tasmania, Gunns Limited, Forest Enterprises Australia Ltd and Great Southern Plantations) have gained ISO 14001 accreditation for their environmental management systems. In addition, Gunns Limited now has Chain of Custody certification (Table 7.1.b.11). All the above certification schemes are subject to regular external audit and all organisations have maintained their certification.

**Table 7.1.b.10 Area (hectres) of Tasmanian forest covered by AFS forest certification by tenure**

Tenure	2001 area (ha)	2006 area (ha)
State forest	0	1,450,000
Private land	0	274,000
Other Crown land	0	0
<b>Total</b>	0	1,724,000

**Table 7.1.b.11` Number of organisations (agencies and companies) with environmental management systems in place**

Year	forest certification schemes		chain of custody certification schemes		environmental management systems (ISO 14001)	
	private	public	private	public	private	public
<b>2001-02</b>	0	0	0	0	0	0
<b>2005-06</b>	1	1	1	0	3	1

## **INDICATOR 7.1.c EXTENT TO WHICH THE ECONOMIC FRAMEWORK SUPPORTS THE CONSERVATION AND SUSTAINABLE MANAGEMENT OF FORESTS**

Government investment, taxation and trade policies impact on the development of, and investment in, forest growing and timber processing activities.

In Australia most of the investment, taxation and trade policies relating to forestry are set on a national basis. These include taxation arrangements for plantation managed investment schemes, the National Forest Policy Statement, and Plantations for Australia, the 2020 Vision. Other national policies such as international trade agreements, National Competition Policy and foreign investment regulations also impact on investment in the forest sector. For this reason the majority of the reporting against this indicator, will be based on national data in Australia's State of the Forests Report 2008.

Indicator 7.1.c reports the extent to which the economic framework (economic policies and measures) supports the conservation and sustainable management of forests through investment and taxation policies and a regulatory environment to meet long-term demands for forest products and services, and trade policies which provide equitable access to international markets.

There is a clear commitment from governments to maintain and strengthen Tasmania's rural and regional economies, communities and the environment in which they operate by encouraging innovation and investment through the development of consistent and non-discriminatory economic policies in order to support sustainable management of forests.

While all governments have an interest in forest management, this activity is constitutionally the responsibility of state governments.

Australian Government policies that influence the nature of such management include direct assistance through schemes such as Natural Heritage Trust programs, exceptional circumstances relief payments, industry structural adjustment programs, and the creation of internationally competitive business and regulatory systems. These systems may be developed under institutional arrangements such as the World Trade Organisation, Closer Economic Relations, free trade agreements, and the adoption of international standards on trade and production. The Australian Government is also directly responsible for the regulation of corporations (*Corporations Act 2001*), taxation, and anti-competition and fair trading regulations (*Trade Practices Act 1974*, administered through the Australian Competition and Consumer Commission).

Section 109 of the Australian Constitution determines that State law cannot be inconsistent with "the law of the Commonwealth". Therefore, the role of the Tasmanian Government cannot be considered without examining the broad Australian Government policies which influence the approaches and outcomes adopted in this State.

To ensure consistency, national and State policies are developed in partnership to support non-discriminating treatment of industries and encourages land managers to adopt best

practices which support sustainable management outcomes and provide the freedom to choose appropriate management activities.

These policies progressively address impediments to the adoption of better commercial forest management, establishment and processing while maintaining commitments to strengthening environmentally sustainable forest management practices.

Support policies include:

- promoting the establishment of conservation reserves on private land (funded under the Australian Government's Forest Conservation Fund and other Tasmanian private land programs);
- providing financial support for the adoption of conservation practices (Natural Heritage Trust);
- providing local government rate relief where forest conservation is being implemented;
- reducing sovereign risk through more secure designation of private forests for forestry purposes under State legislation (Private Timber Reserves established under the *Forest Practices Act 1985*);
- removing impediments which increase the cost of adopting sustainable practices by implementing nationally consistent competition principles, which provide the framework for equitable and transparent pricing arrangements, reduced influence of monopolies, equitable negotiation status and the removal of export controls; and
- direct funding of modern, efficient and integrated infrastructure networks to develop an efficient transport networks to a standard determined by the National Transport Commission policy.

## **INDICATOR 7.1.d CAPACITY TO MEASURE AND MONITOR CHANGES IN THE CONSERVATION AND SUSTAINABLE MANAGEMENT OF FORESTS**

A comprehensive and current measurement and monitoring program provides the basis for all forest planning to support sustainable forest management. Indicator 7.1.d reports the capacity to measure and monitor changes in the conservation and sustainable management of forests. This Indicator was reported under Indicator 7.4 in the 2002 Sustainability Indicators Report.

A capacity to monitor change does not indicate whether such activities are undertaken. Effective monitoring systems also require sufficient resources over time. Monitoring systems in Tasmania reflect resource allocation based on determined priorities. The majority of data for conservation reserve forest are maintained by the Department of Primary Industries and Water (DPIW) and the Parks and Wildlife Service (PWS). On State forest data is held and managed by Forestry Tasmania (FT); while equivalent data for industrial forests on private land are collated by Private Forests Tasmania (PFT), which also receives some data from smaller landowners.

Government agencies and private industrial forest companies have formal and informal systems in place which contribute to the level of knowledge necessary to measure, monitor and report on the sustainability of forests in Tasmania. Appendix 7.1.d details programs established to improve the capacity to monitor and measure changes across all of the sustainable forest management indicators on private and public lands.

Notable programs include:

- The DPIW has completed a statewide coverage of TASVEG, a 1:25,000 scale vegetation map. This is a major enhancement of Tasmania's mapping of forest vegetation—communities as it has finer spatial resolution and more extensive ground-truthing, includes non-forest communities, and differentiates several extra forest communities. TASVEG data is now used as the basis for the National Vegetation Information System (NVIS) datasets for Tasmania. TASVEG mapping is now being routinely updated. Whilst TASVEG has been used to report on vegetation extent in the past, it is currently of limited benefit for this purpose as revision mapping is based on aerial photography of varying age, meaning the whole state can not be updated using this technique on a five year cycle.
- In order to create an endorsed methodology to monitor and map changes in vegetation extent over time, the DPIW commenced a project entitled Monitoring Vegetation Extent Project (MVEP) in April 2005. The project compares statewide Landsat satellite images across a five-year period to detect forest cover changes, which are then verified using information from other sources such as Forest Practices Plans and high-resolution imagery. The mapped changes will be used to update TASVEG and to create a baseline for future monitoring.

- Vegetation mapping (1:25,000) based on aerial photography interpretation and field verification has been completed for the majority of the Tasmanian Wilderness World Heritage Area. Detailed vegetation mapping of some other reserves, including Rocky Cape National Park, has also been undertaken. Coastal values mapping covering vegetation, fauna and earth science has been undertaken for all tenures along the south-east, east and north-east coastal strip from Cockle Creek to the Tamar River and is to be continued along the north-west coast under a current Natural Resource Management project.
- Forestry Tasmania's program of photo-interpreted structural forest-typing progressively remaps State forest on a rolling 20-year cycle at a scale of 1:25 000. The monitoring of change in native forests is being refined with mapping updated from ground surveys of harvesting and other forestry operations, and through Private Forests Tasmania (PFT) implementing a two year satellite imagery program based on Quickbird high resolution satellite imagery for most private forest areas.
- The spatial extent of private plantations is updated annually by PFT and is based on detailed spatial data provided by the large industrial companies, in addition to other updates from field inspections, information from private growers, and information from remote sensing updates. Detailed information on the area of plantation on public land is maintained by Forestry Tasmania. These area datasets, both public and private, form the basis of the Tasmanian information summarised in annual updates of the National Plantation Inventory (NPI).
- Timber volumes in plantation forests on public and industrial forest company lands are routinely monitored through programs of strategic and pre-harvest inventory assessments. However, such assessments are rare on smaller plantation estates. These plantation volume datasets form the basis of the Tasmanian information summarised in the NPI five yearly wood yield reviews.

Other indicators reported elsewhere in this report provide additional information about monitoring systems: for example, area of forest types (Indicator 1.1.a), regeneration surveys (Indicator 2.1.e), forest health surveys (Indicator 3.1.a), water quality (Indicator 4.1.b), and tourism and recreation (Indicators 6.3.a and b). In addition, the programs below are further examples of change monitoring:

- The Parks and Wildlife Service has begun to use historic aerial photo sequences, coupled with recent helicopter assisted video footage, to monitor user impacts in reserves.
- A regular walking track and campsite monitoring program to detect impacts on conservation values for key areas in the reserve system continues.
- Programs that monitor population levels of threatened species provide data which, together with development assessments, academic studies, forest practices surveys,

and other studies, are collated in statewide databases, such as the Natural Values Atlas, which informs the periodic reviews of the status of threatened species.

- At the Warra Long Term Ecological Research site, soils, biodiversity, hydrology and their interactions are being monitored to establish baseline measurements and evaluate the impact of forest practices.

Building on the broad scale monitoring systems in Tasmania, site specific surveys are also undertaken to ensure non-wood values are assessed before forest disturbance activities commence, (as required by the Forest Practices Code 2000 and the Tasmanian Reserve Management Code of Practice). These surveys aim to identify and protect historic and indigenous heritage sites (Criterion 6), geomorphic features (Criterion 4), and threatened species and communities (Criteria 1 and 2). Information from these surveys is contributed to statewide databases for conservation and forest-practices planning. These surveys are intended to identify values that may be affected by proposals and any actions to be taken to avoid or mitigate negative impacts and provide a baseline for future monitoring and assessment.

Under the Forest Practices Act 1985, a formal/stratified sample of up to 15 per cent of Forest Practices Plans across the full range of forest operations on private and public land is audited independently each year. The audit assesses performance outcomes against 120 specific factors, covering the standard of the plans, forest practices assessments and procedures, and operational performance (Indicator 7.1.b).

Annual public reports on the implementation of District Forest Management Plans are prepared by Forestry Tasmania. The *State of the Tasmanian Wilderness World Heritage Report* prepared by the Parks and Wildlife Service in 2004 was awarded the 2005 Australasian Evaluation Society's Caulley Tulloch Prize for best publication in evaluation. The report was also selected as a finalist in the Australian 2006 Banksia Awards for environmental excellence (Category 4: Land and Biodiversity).

Reporting of State trends is achieved through the State of the Forest and the State of the Environment five-year reports.

## **INDICATOR 7.1.e CAPACITY TO CONDUCT AND APPLY RESEARCH AND DEVELOPMENT AIMED AT IMPROVING FOREST MANAGEMENT AND DELIVERY OF FOREST GOODS AND SERVICES**

A scientific understanding of the characteristics and functions of Australian forest ecosystems is needed to underpin their management. Research and development (together defined as creative work carried out systematically to increase the stock of knowledge and its use to devise new applications) provide the basis for biological and timber inventory, for forest management, for silviculture of harvested forests, and for development of methods for assessing sustainable forest management.

In the 2002 Sustainability Indicators Report three Indicators 7.5.a, d and f provided similar information to this indicator.

The capacity to conduct and apply research and development is measured as the number of personnel engaged in this activity, the related expenditure, and the number of research publications (including technical reports) produced. Data in regard to these measures were therefore sourced directly from a number of agencies, research funders and research providers, including the Tasmanian Department of Primary Industries and Water (DPIW), Forestry Tasmania, the Forest Practices Authority, the Hobart node of ensis (a joint venture of CSIRO and Scion), the Cooperative Research Centre (CRC) for Forestry and its predecessor the Cooperative Research Centre for Sustainable Production Forestry, the University of Tasmania and a number of private companies, and information was also sourced indirectly from their Annual Reports.

### **Capacity**

The capacity in Tasmania to conduct the above research in 2005-06 can be presented as the expenditure on research and the number of research staff employed.

**Table 7.1.e.1 Magnitude of Tasmanian forest and forestry research and development effort (2005-06)**

	Government agencies	Private companies	Academia		Total
			staff	students	
<b>Personnel engaged on forest-related R&amp;D (number of Full Time Equivalent positions)</b>	69.0	10.4	38.4	36.3	146.7
<b>Expenditure on forest-related R&amp;D (\$)</b>	\$5,586 000	\$850,000	\$6,767,000		\$12,353,000
<b>Research publications in last 5 years (number)</b>	204	12	306		522

The grouping “Academia” includes Tasmanian-based CRC activities (principally the CRC for Forestry but also the Bushfire CRC), CSIRO Forestry and Forest Products through its joint venture ensis, and various schools of the University of Tasmania. Students are higher-degree students engaged full time in research, on projects often determined in collaboration with the CRC for Forestry or private forestry companies. Staff and students in Academia comprise approximately half the total number of personnel engaged in forest-related research and development in Tasmania, and account for approximately half the total expenditure.

Much Tasmanian forestry-related and forest-related research effort occurs through the CRC for Forestry. This CRC was funded under Round Nine of the CRC Program for a seven-year period, covering July 2005 to June 2012, and its resources include \$26.6 million of CRC Program cash, \$10.5 million in cash from its member participants, and in-kind resources from its member participants of \$46.7 million. Tasmanian member participants in the CRC for Forestry include CSIRO, the Department of Economic Development, the Forests and Forest Industry Council of Tasmania, Forest Enterprises Australia, the Forest Practices Authority, Forestry Tasmania, Gunns Ltd, Norske Skog, and the University of Tasmania. The CRC for Forestry continues work of the two previous forestry-based CRCs, the CRC for Temperate Hardwood Forestry (1991-1997) and the CRC for Sustainable Production Forestry (1997-2005), both of which also had a substantial Tasmanian presence. The research of the CRC for Forestry is organised into four programs: Managing and Monitoring for Growth and Health, High-value Wood Resources, Harvesting and Operations, and Trees in the Landscape. Each program has activities in mainland states as well as Tasmania, ensuring that research results created interstate are also available for development in the Tasmanian context.

The grouping “Government agencies” in Table 7.1.e.1 includes the Tasmanian Department of Primary Industries and Water (DPIW) and Forestry Tasmania, with a similar number of research personnel in each. State Government staff (including Forestry Tasmania staff) comprises approximately half the total number of personnel engaged in forest-related research and development in Tasmania, and account for approximately half the total expenditure. Forestry Tasmania’s Division of Forest Research and Development undertakes research into native forest silviculture, plantation silviculture, biology and

conservation (including forest health surveillance), and together with the Parks and Wildlife Service, part of the Department of Tourism, Arts and the Environment, manages the Warra Long-term Ecological Research Site in southern Tasmania. At least one-third of Forestry Tasmania's research expenditure is devoted to development and extension work involved in the strategic or operational uptake of research. Research personnel in the Forest Practices Authority are also included in the Government Agencies grouping - the Research and Advisory Program of the Forest Practices Authority employs scientists who undertake monitoring and research programs in areas related to archaeology, botany, geomorphology, soils science, visual landscape and zoology and that contribute to the scientific knowledge underpinning the Forest Practices Code and associated specialist manuals.

The number of full time equivalent (FTE) researchers reported in the "Private companies" grouping in Table 7.1.e.1 is only an estimate, as less data have been provided here as compared to "Government agencies" or "Academia". The number of researchers employed in private companies has undergone a real reduction in recent years, at least in part, through outsourcing of private company research to CRCs and other external research providers. Private company forestry research expenditure is low; however, all private company grants to CRCs and Universities for research performed in collaboration are accounted for under Academia.

A total of 537 forest-related and forestry-related research publications were produced in Tasmania over the five calendar years 2002-2006. A list of these publications is provided in Appendix 1 of the *Report on Implementation of the Tasmanian Regional Forest Agreement 2002-2007* (Tasmanian and Australian Governments 2007). Publications were counted if they contained research specifically relevant to Tasmanian forestry issues as taken from nine Priority Areas of Research listed in Attachment 13 to the 1997 Tasmanian Regional Forest Agreement (RFA). Research publications include refereed journal publications, books and book chapters, and technical reports, while confidential reports, conference papers and presentations, higher degree theses, and reports covering basic science applicable more broadly than Tasmania are not included. The majority of the 537 research reports (508 in all, or 95 per cent) are in four of the nine Priority Areas of Research (Biodiversity Conservation and Management, Pests, Silviculture Techniques, and Soil and Water Conservation).

### **Research areas**

The research topics to which the Tasmania capacity is directed can be summarised in Table 7.1.e.2.

The 2002 Sustainability Indicators Report reported a total of 111.7 fulltime equivalent research staff as at 30 June 2001. This figure is not directly comparable with the total in Table 7.1.e.2 as research fields were categorised differently and all research areas may not have been reported in 2002.

The majority of current researchers are in flora and fauna ecology, silviculture, tree breeding, hydrology and pests. It is notable that the research effort in silviculture has been maintained, even though this is regarded less and less as an academic discipline. Not captured in these figures is the increasing research effort undertaken at the landscape level, signifying the emerging disciplines of conservation biology, landscape ecology, landscape genetics and dynamic forest management, for example, as well as the increasing recognition of the need to manage forests at this scale.

**Table 7.1.e.2 Full-time personnel engaged in forest-related research and development in 2005-06 (FTE)**

	Plantations	Native forest	Total
<b>Fauna ecology (including genetics)</b>	16.6	23.5	40.1
<b>Flora ecology (including genetics)</b>	5.7	32.8	38.5
<b>Silviculture</b>	21.6	3.6	25.2
<b>Tree breeding</b>	12.7	0	12.7
<b>Forest pathology</b>	6.5	2	8.5
<b>Forest hydrology</b>	3.8	4.5	8.3
<b>Timber use</b>	2.4	0.4	2.8
<b>Statistical analysis</b>	1.2	1.2	2.4
<b>Climate change</b>	1.1	0.7	1.8
<b>Forest entomology</b>	0	1.6	1.6
<b>Fire ecology</b>	0	1.1	1.1
<b>Fire behaviour</b>	1.0	0	1.0
<b>Non-timber forest products</b>	0	0.4	0.4
<b>Agroforestry</b>	0	0	0
<b>Other</b>	1.5	0.9	2.4
<b>Total</b>	74	72.7	146.7

As reported in the 2002 Sustainability Indicators Report, the Warra Long-Term Ecological Research Site continues to provide a focal area for research into wet eucalypt forests and their management, with this research being supported by nine site partner agencies. Over 100 research projects have now been conducted at Warra (see <http://www.warra.com>), and many of them are on-going. These projects are progressively documenting the climate, geomorphology, hydrology and aquatic and terrestrial biodiversity of Warra, as well as testing the development of indicators of sustainable forest management. The long-term 'flagship' projects at Warra are a silvicultural systems trial, a log decay study, baseline altitudinal monitoring plots, a hydrological programme and a set of wildfire chronosequence plots. Findings from these and other shorter-term projects are directed into forest management. Thus, the silvicultural systems trial has provided the research outputs on variable retention

silviculture that enabled the Tasmanian State Government to commit to phase-out clearfelling in old-growth forests, while projects on coarse woody debris and its associated biodiversity, along with the wildfire chronosequence plots, inform the management of key structural attributes in production forests at a range of spatial and temporal scales.

## APPENDIX 1.1

Table 1.1.a Extent of forest types by tenure (a)

RFA Forest Vegetation Community	Land Classification (Tenure)				TOTAL (ha)	Change in area since 1996 %	Change in area since 2001 %
	Conservation reserves (ha) (b)	Other State forest (ha) (c)	Other publicly managed land (ha)	Private freehold land (ha)			
<b>Dry eucalypt forests</b>							
Coastal <i>E. amygdalina</i> dry sclerophyll forest	60 000	51 000	8 000	65 000	185 000	-2.9	-2.4
Dry <i>E. delegatensis</i> forest	72 000	107 000	11 000	97 000	287 000	-0.9	-0.5
Dry <i>E. nitida</i> forest	135 000	17 000	2 000	6 000	159 000	-0.2	-0.2
Dry <i>E. obliqua</i> forest	40 000	63 000	6 000	50 000	159 000	-2.8	-1.7
<i>E. amygdalina</i> forest on dolerite	21 000	23 000	2 000	129 000	175 000	-1.7	-1.2
<i>E. amygdalina</i> forest on sandstone	4 000	6 000	2 000	17 000	30 000	-0.3	-0.2
<i>E. morrisbyi</i> forest	20	0	0	0	20	0.0	0.0
<i>E. pauciflora</i> on Jurassic dolerite	1 000	3 000	1 000	14 000	19 000	-0.8	-0.8
<i>E. pauciflora</i> on sediments	4 000	3 000	300	9 000	16 000	-1.1	-1.1
<i>E. pulchella</i> / <i>globulus</i> / <i>viminalis</i> grassy shrubby dry sclerophyll forest	26 000	11 000	14 000	98 000	150 000	-1.2	-1.0
<i>E. risdonii</i> forest	200	0	10	200	400	-0.7	-0.7
<i>E. rodwayi</i> forest	200	300	100	8 000	9 000	-0.8	-0.7
<i>E. sieberi</i> forest on granite	4 000	11 000	100	2 000	18 000	-0.6	-0.5
<i>E. sieberi</i> on other substrates	8 000	30 000	400	7 000	46 000	-0.6	-0.5
<i>E. tenuiramis</i> on dolerite	5 000	2 000	40	700	8 000	-0.6	-0.6
<i>E. tenuiramis</i> on granite	3 000	0	40	200	3 000	0.0	0.0
<i>E. viminalis</i> and/or <i>E. globulus</i> coastal shrubby forest	300	10	20	900	1 000	-0.1	-0.1
<i>E. viminalis</i> / <i>ovata</i> / <i>amygdalina</i> / <i>obliqua</i> damp sclerophyll forest	10 000	13 000	600	14 000	38 000	-6.5	-3.1
Furneaux <i>E. nitida</i> forest	19 000	0	5 000	7 000	30 000	-0.1	-0.1
Furneaux <i>E. viminalis</i> forest	100	0	0	20	100	0.0	0.0
Grassy <i>E. globulus</i> forest	6 000	400	400	7 000	14 000	-1.8	-0.7
Grassy <i>E. viminalis</i> forest	3 000	1 000	400	107 000	112 000	-1.6	-1.5
Inland <i>E. amygdalina</i> forest	3 000	1 000	800	20 000	25 000	-4.5	-2.9
Inland <i>E. tenuiramis</i> forest	7 000	1 000	700	45 000	54 000	-1.4	-1.2
Shrubby <i>E. ovata</i> forest	300	200	200	6 000	7 000	-5.7	-4.5
<b>Wet eucalypt forests</b>							
<i>E. brookeriana</i> wet forest	1 000	1 000	20	2 000	4 000	-4.9	-2.7
<i>E. regnans</i> forest	10 000	52 000	1 000	5 000	68 000	-10.3	-5.5

RFA Forest Vegetation Community	Land Classification (Tenure)				TOTAL (ha)	Change in area since 1996 %	Change in area since 2001 %
	Conservation reserves (ha) (b)	Other State forest (ha) (c)	Other publicly managed land (ha)	Private freehold land (ha)			
King Island <i>E. globulus</i> / <i>brookeriana</i> / <i>viminalis</i> forest	200	400	200	2 000	2 000	-0.1	-0.1
Tall <i>E. delegatensis</i> forest	70 000	158 000	3 000	42 000	272 000	-4.7	-2.0
Tall <i>E. nitida</i> forest	66 000	7 000	300	700	74 000	-0.2	-0.1
Tall <i>E. obliqua</i> forest	80 000	243 000	7 000	66 000	396 000	-7.0	-4.0
Wet <i>E. viminalis</i> forest on basalt	700	600	40	2 000	4 000	-11.0	-6.8
<b>Sub-alpine eucalypt forests</b>							
<i>E. coccifera</i> dry forest	39 000	6 000	3 000	7 000	55 000	0.0	0.0
<i>E. subcrenulata</i> forest	8 000	2 000	0	20	10 000	0.0	0.0
<b>Non-eucalypt forests</b>							
<i>Acacia melanoxylon</i> forest on flats	2 000	5 000	200	2 000	9 000	-0.9	-0.6
<i>Acacia melanoxylon</i> forest on rises	3 000	6 000	400	3 000	13 000	-5.4	-2.9
<i>Allocasuarina verticillata</i> forest	600	0	100	700	1 000	-0.7	-0.7
<i>Banksia serrata</i> woodland	100	0	0	40	200	0.0	0.0
<i>Callidendrous</i> and thamnic rainforest on fertile sites	93 000	80 000	2 000	11 000	186 000	-2.9	-2.2
<i>Callitris rhomboidea</i> forest	400	60	60	300	800	0.0	0.0
Huon Pine forest	8 000	1 000	40	10	9 000	0.0	0.0
King Billy Pine forest	17 000	3 000	700	200	20 000	0.7	0.7
King Billy Pine with deciduous beech	800	30	40	0	800	0.0	0.0
<i>Leptospermum</i> sp./ <i>Melaleuca squarrosa</i> swamp forest	10 000	3 000	300	5 000	19 000	-1.3	-1.0
<i>Melaleuca ericifolia</i> forest	400	10	60	100	600	-0.1	-0.1
<i>Notelaea ligustrina</i> and/or <i>Pomaderris apetala</i> forest	200	20	20	40	300	-2.0	-1.4
Pencil Pine forest	300	0	0	0	300	0.0	0.0
Pencil Pine with deciduous beech	200	0	0	0	200	0.0	0.0
Silver wattle ( <i>Acacia dealbata</i> ) forest	8 000	25 000	700	16 000	50 000	-7.5	-3.8
Thamnic rainforest on less fertile sites	268 000	87 000	10 000	11 000	376 000	-0.6	-0.4
Hardwood Plantation <sup>(d)</sup>	200	47 000	600	111 000	158 000	} 61.7	21.2
Softwood Plantation <sup>(d)</sup>	1 000	55 000	300	22 000	78 000		
<b>TOTAL</b>	<b>1 122 000</b>	<b>1 128 000</b>	<b>85 000</b>	<b>1 018 000</b>	<b>3 353 000</b>	<b>0.0</b>	<b>-0.3</b>

(a) Forest extent is as at the first quarter of 2005 and tenure is as at 30 June 2006

(b) Nature Conservation Act, Crown Lands Act and Forest Reserves

(c) Includes Multiple-Use Forest

(d) Working plantations in Hollybank, Oldina and Dalgarth Forest Reserves used for educational and recreational purposes.

**Table 1.1.b(i) Area of native forest types by growth stage and tenure groups (a)**

**Conservation Reserves (b)**

RFA Forest Vegetation Community	Growth Stage (hectares) (e)				
	Regeneration	Regrowth	Mature (including overmature)	Unknown	TOTAL
<b>Dry eucalypt forests</b>					
Coastal <i>E. amygdalina</i> dry sclerophyll forest	0	2200	53900	4300	60400
Dry <i>E. delegatensis</i> forest	80	9300	60400	2700	72400
Dry <i>E. nitida</i> forest	0	31000	104100	20	135100
Dry <i>E. obliqua</i> forest	100	4800	34500	300	39800
<i>E. amygdalina</i> forest on dolerite	50	1100	19300	200	20600
<i>E. amygdalina</i> forest on sandstone	0	60	4400	60	4500
<i>E. morrisbyi</i> forest	0	0	20	0	20
<i>E. pauciflora</i> on Jurassic dolerite	0	100	1000	50	1200
<i>E. pauciflora</i> on sediments	0	200	3600	30	3800
<i>E. pulchella</i> / <i>globulus</i> / <i>viminalis</i> grassy shrubby dry sclerophyll forest	200	1600	24500	0	26300
<i>E. risdonii</i> forest	0	100	20	0	200
<i>E. rodwayi</i> forest	0	20	200	10	200
<i>E. sieberi</i> forest on granite	0	30	3600	100	3700
<i>E. sieberi</i> on other substrates	0	300	8000	200	8500
<i>E. tenuiramis</i> on dolerite	0	400	4900	0	5300
<i>E. tenuiramis</i> on granite	0	0	2800	0	2800
<i>E. viminalis</i> and/or <i>E. globulus</i> coastal shrubby forest	0	20	300	0	300
<i>E. viminalis</i> / <i>ovata</i> / <i>amygdalina</i> / <i>obliqua</i> damp sclerophyll forest	0	1500	7900	300	9700
Furneaux <i>E. nitida</i> forest	0	10	18800	0	18800
Furneaux <i>E. viminalis</i> forest	0	0	100	0	100
Grassy <i>E. globulus</i> forest	0	300	5800	0	6100
Grassy <i>E. viminalis</i> forest	0	100	2500	60	2700
Inland <i>E. amygdalina</i> forest	0	300	2300	20	2600
Inland <i>E. tenuiramis</i> forest	0	1200	6200	30	7400
Shrubby <i>E. ovata</i> forest	0	50	200	20	300

RFA Forest Vegetation Community	Growth Stage (hectares) (e)				
	Regeneration	Regrowth	Mature (including overmature)	Unknown	TOTAL
<b>Wet eucalypt forests</b>					
<i>E. brookeriana</i> wet forest	0	400	900	0	1400
<i>E. regnans</i> forest	10	2000	8000	80	10100
King Island <i>E. globulus</i> / <i>brookeriana</i> / <i>viminalis</i> forest	0	100	90	0	200
Tall <i>E. delegatensis</i> forest	10	7200	62000	1000	70200
Tall <i>E. nitida</i> forest	0	10600	55900	10	66500
Tall <i>E. obliqua</i> forest	200	17900	61500	400	80100
Wet <i>E. viminalis</i> forest on basalt	0	300	400	30	700
<b>Sub-alpine eucalypt forests</b>					
<i>E. coccifera</i> dry forest	0	8200	27300	3200	38700
<i>E. subcrenulata</i> forest	0	1100	6600	100	7800
<b>Non-eucalypt forests (d)</b>					
<i>Acacia melanoxylon</i> forest on flats	0	0	0	2300	2300
<i>Acacia melanoxylon</i> forest on rises	0	0	0	3200	3200
<i>Allocasuarina verticillata</i> forest	0	0	0	600	600
<i>Banksia serrata</i> woodland	0	0	0	100	100
<i>Callidendrous</i> and thamnic rainforest on fertile sites	0	0	0	93100	93100
<i>Callitris rhomboidea</i> forest	0	0	0	400	400
Huon Pine forest	0	0	0	7500	7500
King Billy Pine forest	0	0	0	16800	16800
King Billy Pine with deciduous beech	0	0	0	800	800
<i>Leptospermum</i> sp./ <i>Melaleuca squarrosa</i> swamp forest	0	0	0	10000	10000
<i>Melaleuca ericifolia</i> forest	0	0	0	400	400
<i>Notelaea ligustrina</i> and/or <i>Pomaderris apetala</i> forest	0	0	0	200	200
Pencil Pine forest	0	0	0	300	300
Pencil Pine with deciduous beech	0	0	0	200	200
Silver wattle ( <i>Acacia dealbata</i> ) forest	0	0	0	8200	8200
Thamnic rainforest on less fertile sites	0	0	0	268400	268400
<b>TOTAL</b>	700	102700	592000	425600	1121000

i) Other State forest (c)

RFA Forest Vegetation Community	Growth Stage				
	Regeneration	Regrowth	Mature (including overmature)	Unknown	TOTAL
<b>Dry eucalypt forests</b>					
Coastal <i>E. amygdalina</i> dry sclerophyll forest	3800	4000	40900	2600	51300
Dry <i>E. delegatensis</i> forest	6500	26500	70500	3100	106600
Dry <i>E. nitida</i> forest	700	3600	12200	50	16500
Dry <i>E. obliqua</i> forest	5600	19600	36300	1400	63000
<i>E. amygdalina</i> forest on dolerite	1400	4500	16900	400	23100
<i>E. amygdalina</i> forest on sandstone	500	1500	3900	10	6000
<i>E. morrisbyi</i> forest	0	0	0	0	0
<i>E. pauciflora</i> on Jurassic dolerite	20	100	2200	200	2500
<i>E. pauciflora</i> on sediments	90	200	2800	300	3300
<i>E. pulchella</i> / <i>globulus</i> / <i>viminalis</i> grassy shrubby dry sclerophyll forest	900	2200	8300	10	11400
<i>E. risdonii</i> forest	0	0	0	0	0
<i>E. rodwayi</i> forest	20	60	200	20	300
<i>E. sieberi</i> forest on granite	900	800	9500	300	11500
<i>E. sieberi</i> on other substrates	3700	2100	23600	400	29800
<i>E. tenuiramis</i> on dolerite	100	500	1700	0	2300
<i>E. tenuiramis</i> on granite	0	0	0	0	0
<i>E. viminalis</i> and/or <i>E. globulus</i> coastal shrubby forest	0	0	0	0	10
<i>E. viminalis</i> / <i>ovata</i> / <i>amygdalina</i> / <i>obliqua</i> damp sclerophyll forest	1600	3500	7900	400	13400
Furneaux <i>E. nitida</i> forest	0	0	0	0	0
Furneaux <i>E. viminalis</i> forest	0	0	0	0	0
Grassy <i>E. globulus</i> forest	10	200	200	0	400
Grassy <i>E. viminalis</i> forest	90	600	800	10	1500
Inland <i>E. amygdalina</i> forest	30	200	900	70	1200
Inland <i>E. tenuiramis</i> forest	100	300	800	10	1200
Shrubby <i>E. ovata</i> forest	0	60	100	40	200

RFA Forest Vegetation Community	Growth Stage				
	Regeneration	Regrowth	Mature (including overmature)	Unknown	TOTAL
<b>Wet eucalypt forests</b>					
<i>E. brookeriana</i> wet forest	30	500	700	10	1300
<i>E. regnans</i> forest	4600	27300	19100	1100	52100
King Island <i>E. globulus</i> / <i>brookeriana</i> / <i>viminalis</i> forest	0	300	60	0	400
Tall <i>E. delegatensis</i> forest	12800	42400	98600	3800	157600
Tall <i>E. nitida</i> forest	200	2300	4200	70	6800
Tall <i>E. obliqua</i> forest	25100	97100	117400	3200	242700
Wet <i>E. viminalis</i> forest on basalt	0	300	200	20	600
<b>Sub-alpine eucalypt forests</b>					
<i>E. coccifera</i> dry forest	30	1400	3800	600	5900
<i>E. subcrenulata</i> forest	100	700	1500	0	2400
<b>Non-eucalypt forests (d)</b>					
<i>Acacia melanoxylon</i> forest on flats	0	0	0	4700	4700
<i>Acacia melanoxylon</i> forest on rises	0	0	0	5700	5700
<i>Allocasuarina verticillata</i> forest	0	0	0	0	0
<i>Banksia serrata</i> woodland	0	0	0	0	0
<i>Callidendrous</i> and thamnic rainforest on fertile sites	0	0	0	80300	80300
<i>Callitris rhomboidea</i> forest	0	0	0	60	60
Huon pine forest	0	0	0	1400	1400
King Billy pine forest	0	0	0	2600	2600
King Billy pine with deciduous beech	0	0	0	30	30
<i>Leptospermum</i> sp./ <i>Melaleuca squarrosa</i> swamp forest	0	0	0	3400	3400
<i>Melaleuca ericifolia</i> forest	0	0	0	10	10
<i>Notelaea ligustrina</i> and/or <i>Pomaderris apetala</i> forest	0	0	0	20	20
Pencil pine forest	0	0	0	0	0
Pencil pine with deciduous beech	0	0	0	0	0
Silver wattle ( <i>Acacia dealbata</i> ) forest	0	0	0	25100	25100
Thamnic rainforest on less fertile sites	0	0	0	86800	86800
<b>TOTAL</b>	<b>68800</b>	<b>242900</b>	<b>485400</b>	<b>228500</b>	<b>1025500</b>

ii) Other Publicly Managed Land

RFA Forest Vegetation Community	Growth Stage				
	Regeneration	Regrowth	Mature (including overmature)	Unknown	TOTAL
<b>Dry eucalypt forests</b>					
Coastal <i>E. amygdalina</i> dry sclerophyll forest	0	800	6400	800	8000
Dry <i>E. delegatensis</i> forest	10	700	8800	1300	10800
Dry <i>E. nitida</i> forest	0	300	1700	0	2000
Dry <i>E. obliqua</i> forest	200	1700	4200	100	6200
<i>E. amygdalina</i> forest on dolerite	10	300	2000	60	2300
<i>E. amygdalina</i> forest on sandstone	0	400	1800	70	2200
<i>E. morrisbyi</i> forest	0	0	0	0	0
<i>E. pauciflora</i> on Jurassic dolerite	0	200	1000	200	1300
<i>E. pauciflora</i> on sediments	0	40	200	40	300
<i>E. pulchella</i> / <i>globulus</i> / <i>viminalis</i> grassy shrubby dry sclerophyll forest	300	2100	11400	0	13800
<i>E. risdonii</i> forest	0	0	10	0	10
<i>E. rodwayi</i> forest	0	10	70	20	100
<i>E. sieberi</i> forest on granite	0	10	100	0	100
<i>E. sieberi</i> on other substrates	0	50	300	20	400
<i>E. tenuiramis</i> on dolerite	0	0	40	0	40
<i>E. tenuiramis</i> on granite	0	0	40	0	40
<i>E. viminalis</i> and/or <i>E. globulus</i> coastal shrubby forest	0	20	0	0	20
<i>E. viminalis</i> / <i>ovata</i> / <i>amygdalina</i> / <i>obliqua</i> damp sclerophyll forest	0	200	200	100	600
Furneaux <i>E. nitida</i> forest	0	300	4200	0	4500
Furneaux <i>E. viminalis</i> forest	0	0	0	0	0
Grassy <i>E. globulus</i> forest	0	80	300	0	400
Grassy <i>E. viminalis</i> forest	0	100	300	0	400
Inland <i>E. amygdalina</i> forest	0	200	500	60	800
Inland <i>E. tenuiramis</i> forest	0	100	600	0	700
Shrubby <i>E. ovata</i> forest	0	70	60	30	200

RFA Forest Vegetation Community	Growth Stage				
	Regeneration	Regrowth	Mature (including overmature)	Unknown	TOTAL
<b>Wet eucalypt forests</b>					
<i>E. brookeriana</i> wet forest	0	20	0	0	20
<i>E. regnans</i> forest	100	500	700	10	1300
King Island <i>E. globulus</i> / <i>brookeriana</i> / <i>viminalis</i> forest	0	60	100	0	200
Tall <i>E. delegatensis</i> forest	100	600	1800	100	2600
Tall <i>E. nitida</i> forest	0	20	300	0	300
Tall <i>E. obliqua</i> forest	300	2000	4400	80	6800
Wet <i>E. viminalis</i> forest on basalt	0	30	10	0	40
<b>Sub-alpine eucalypt forests</b>	0	0	0	0	0
<i>E. coccoifera</i> dry forest	0	400	2300	400	3100
<i>E. subcrenulata</i> forest	0	0	0	0	0
<b>Non-eucalypt forests (d)</b>					
<i>Acacia melanoxylon</i> forest on flats	0	0	0	200	200
<i>Acacia melanoxylon</i> forest on rises	0	0	0	400	400
<i>Allocasuarina verticillata</i> forest	0	0	0	100	100
<i>Banksia serrata</i> woodland	0	0	0	0	0
<i>Callidendrous</i> and thamnic rainforest on fertile sites	0	0	0	2300	2300
<i>Callitris rhomboidea</i> forest	0	0	0	60	60
Huon Pine forest	0	0	0	40	40
King Billy Pine forest	0	0	0	700	700
King Billy Pine with deciduous beech	0	0	0	40	40
<i>Leptospermum</i> sp./ <i>Melaleuca squarrosa</i> swamp forest	0	0	0	300	300
<i>Melaleuca ericifolia</i> forest	0	0	0	60	60
<i>Notelaea ligustrina</i> and/or <i>Pomaderris apetala</i> forest	0	0	0	20	20
Pencil Pine forest	0	0	0	0	0
Pencil Pine with deciduous beech	0	0	0	0	0
Silver wattle ( <i>Acacia dealbata</i> ) forest	0	0	0	700	700
Thamnic rainforest on less fertile sites	0	0	0	10000	10000
<b>TOTAL</b>	1100	11300	53800	18400	84600

iii) Private freehold land

RFA Forest Vegetation Community	Growth Stage				
	Regeneration	Regrowth	Mature (including overmature)	Unknown	TOTAL
<b>Dry eucalypt forests</b>					
Coastal <i>E. amygdalina</i> dry sclerophyll forest	300	9300	45100	10300	64900
Dry <i>E. delegatensis</i> forest	4700	11000	64300	17200	97300
Dry <i>E. nitida</i> forest	10	500	4900	400	5800
Dry <i>E. obliqua</i> forest	1300	15700	29700	3800	50400
<i>E. amygdalina</i> forest on dolerite	2400	15300	96200	15400	129200
<i>E. amygdalina</i> forest on sandstone	60	2300	14000	900	17400
<i>E. morrisbyi</i> forest	0	0	0	0	0
<i>E. pauciflora</i> on Jurassic dolerite	500	1700	8600	2900	13600
<i>E. pauciflora</i> on sediments	300	1000	5800	1500	8600
<i>E. pulchella</i> / <i>globulus</i> / <i>viminalis</i> grassy shrubby dry sclerophyll forest	1300	11600	83400	1700	98000
<i>E. risdonii</i> forest	0	200	40	0	200
<i>E. rodwayi</i> forest	300	1300	5100	1300	8000
<i>E. sieberi</i> forest on granite	0	300	1400	500	2200
<i>E. sieberi</i> on other substrates	300	1300	5000	500	7000
<i>E. tenuiramis</i> on dolerite	0	90	600	0	700
<i>E. tenuiramis</i> on granite	0	0	200	0	200
<i>E. viminalis</i> and/or <i>E. globulus</i> coastal shrubby forest	0	10	900	0	900
<i>E. viminalis</i> / <i>ovata</i> / <i>amygdalina</i> / <i>obliqua</i> damp sclerophyll forest	200	7600	3600	2800	14300
Furneaux <i>E. nitida</i> forest	0	300	6200	0	6500
Furneaux <i>E. viminalis</i> forest	0	0	20	0	20
Grassy <i>E. globulus</i> forest	10	1200	6000	100	7400
Grassy <i>E. viminalis</i> forest	1200	11600	86600	7600	107000
Inland <i>E. amygdalina</i> forest	30	3600	14800	1700	20100
Inland <i>E. tenuiramis</i> forest	100	11600	32500	700	44900
Shrubby <i>E. ovata</i> forest	100	1900	3000	1100	6100

<b>Wet eucalypt forests</b>					
<i>E. brookeriana</i> wet forest	90	500	900	200	1700
<i>E. regnans</i> forest	100	2800	1400	500	4700
King Island <i>E. globulus</i> / <i>brookeriana</i> / <i>viminalis</i> forest	0	1100	700	0	1700
Tall <i>E. delegatensis</i> forest	3000	8400	22500	7700	41500
Tall <i>E. nitida</i> forest	0	300	400	20	700
Tall <i>E. obliqua</i> forest	800	40200	18900	6300	66200
Wet <i>E. viminalis</i> forest on basalt	30	900	900	600	2400
<b>Sub-alpine eucalypt forests</b>					
<i>E. coccifera</i> dry forest	0	900	4700	1200	6800
<i>E. subcrenulata</i> forest	0	0	20	0	20
<b>Non-eucalypt forests (d)</b>					
<i>Acacia melanoxylon</i> forest on flats	0	0	0	1700	1700
<i>Acacia melanoxylon</i> forest on rises	0	0	0	3300	3300
<i>Allocasuarina verticillata</i> forest	0	0	0	700	700
<i>Banksia serrata</i> woodland	0	0	0	40	40
<i>Callidendrous</i> and thamnic rainforest on fertile sites	0	0	0	10800	10800
<i>Callitris rhomboidea</i> forest	0	0	0	300	300
Huon pine forest	0	0	0	10	10
King Billy pine forest	0	0	0	10	10
King Billy pine with deciduous beech	0	0	0	0	0
<i>Leptospermum</i> sp./ <i>Melaleuca squarrosa</i> swamp forest	0	0	0	5000	5000
<i>Melaleuca ericifolia</i> forest	0	0	0	100	100
<i>Notelaea ligustrina</i> and/or <i>Pomaderris apetala</i> forest	0	0	0	40	40
Pencil pine forest	0	0	0	0	0
Pencil pine with deciduous beech	0	0	0	0	0
Silver wattle ( <i>Acacia dealbata</i> ) forest	0	0	0	15900	15900
Thamnic rainforest on less fertile sites	0	0	0	10600	10600
<b>TOTAL</b>	<b>17100</b>	<b>164400</b>	<b>568200</b>	<b>135300</b>	<b>884900</b>

Notes: (a) Forest extent is as at the first quarter of 2005 and tenure is as at 30 June 2006

(b) Nature Conservation Act, Crown Lands Act, and Forest Reserves

(c) Multiple-Use Forest

(d) Non-eucalypt communities cannot readily be mapped by growth stage

(e) Rounded to nearest 10 ha if less than 100 ha, else to nearest hundred hectares. Figures in Total rows are the rounded actual totals.

**Table 1.1.b(ii) Distribution of growth stages of each native forest type within broad tenure groups**

(Figures are the area of each growth stage expressed as a percentage of the total area of that forest type within a tenure group)

RN = Regeneration RG = Regrowth MO = Mature/Overmature UNK = Unknown

RFA Forest Vegetation Community	Land Tenure Group											
	Conservation & Public & Forest Reserves				Other State forest and publicly managed land				Private freehold land			
	RN %	RG %	MO %	UNK %	RN %	RG %	MO %	UNK %	RN %	RG %	MO %	UNK %
<b>Dry eucalypt forest</b>												
Coastal <i>E. amygdalina</i> dry forest	0	4	89	7	6	8	80	6	0	14	69	16
Dry <i>E. delegatensis</i> forest	0	13	83	4	6	23	68	4	5	11	66	18
Dry <i>E. nitida</i> forest	0	23	77	0	4	21	75	0	0	8	85	7
Dry <i>E. obliqua</i> forest	0	12	87	1	8	31	58	2	3	31	59	7
<i>E. amygdalina</i> on dolerite	0	5	94	1	5	19	74	2	2	12	74	12
<i>E. amygdalina</i> on sandstone	0	1	97	1	6	23	70	1	0	13	81	5
<i>E. morrisbyi</i> forest	0	0	100	0	0	0	0	0	0	0	100	0
<i>E. pauciflora</i> on dolerite	0	10	86	5	0	7	82	10	3	12	63	21
<i>E. pauciflora</i> on sediments	0	5	94	1	2	6	84	8	4	11	67	18
<i>E. pulchella/globulus/viminalis</i> grassy shrubby dry forest	1	6	93	0	5	17	78	0	1	12	85	2
<i>E. risdonii</i> forest	0	86	14	0	0	22	78	0	0	79	21	0
<i>E. rodwayi</i> forest	0	10	83	7	5	17	71	8	3	16	64	17
<i>E. sieberi</i> forest on granite	0	1	97	3	8	7	83	3	0	14	63	22
<i>E. sieberi</i> on other substrates	0	3	95	2	12	7	79	2	4	18	71	7
<i>E. tenuiramis</i> on dolerite	0	8	92	0	6	22	72	0	0	14	86	0
<i>E. tenuiramis</i> on granite	0	0	100	0	0	0	100	0	0	0	100	0
<i>E. viminalis</i> and/or <i>E. globulus</i> coastal shrubby forest	0	8	91	2	0	76	22	2	0	1	98	0
<i>E. viminalis/ovata/amygdalina/obliqua</i> damp forest	0	16	81	3	11	26	58	4	2	53	26	20
Furneaux <i>E. nitida</i> forest	0	0	100	0	0	6	94	0	0	5	95	0
Furneaux <i>E. viminalis</i> forest	0	0	100	0	0	0	0	0	0	0	100	0
Grassy <i>E. globulus</i> forest	0	5	95	0	1	34	65	0	0	17	81	2
Grassy <i>E. viminalis</i> forest	0	4	93	2	5	36	58	1	1	11	81	7
Inland <i>E. amygdalina</i> forest	0	11	88	1	1	22	70	6	0	18	74	8
Inland <i>E. tenuiramis</i> forest	0	16	83	0	5	23	71	0	0	26	72	1
Shrubby <i>E. ovata</i> forest	0	17	75	8	1	33	49	17	2	30	49	19

RFA Forest Vegetation Community	Land Tenure Group											
	Conservation & Public & Forest Reserves				Other State forest and publicly managed land				Private freehold land			
	RN %	RG %	MO %	UNK %	RN %	RG %	MO %	UNK %	RN %	RG %	MO %	UNK %
<b>Wet eucalypt forest</b>												
<i>E. brookeriana</i> wet forest	0	32	68	0	2	42	55	1	5	30	53	11
<i>E. regnans</i> forest	0	20	79	1	9	52	37	2	2	59	29	10
King Island <i>E. globulus</i> / <i>brookeriana/viminalis</i> forest	0	51	49	0	0	68	32	0	0	62	38	0
Tall <i>E. delegatensis</i> forest	0	10	88	1	8	27	63	2	7	20	54	19
Tall <i>E. nitida</i> forest	0	16	84	0	3	33	64	1	0	41	56	3
Tall <i>E. obliqua</i> forest	0	22	77	1	10	40	49	1	1	61	29	10
Wet <i>E. viminalis</i> on basalt	0	42	54	4	0	56	40	4	1	36	38	25
<b>Sub-alpine eucalypt forest</b>												
<i>E. coccifera</i> dry forest	0	21	71	8	0	20	68	12	0	13	70	18
<i>E. subcrenulata</i> forest	0	14	85	1	5	31	64	0	0	25	75	0
<b>Non-eucalypt forest*</b>												
<i>Acacia melanoxylon</i> on flats	0	0	0	100	0	0	0	100	0	0	0	100
<i>Acacia melanoxylon</i> on rises	0	0	0	100	0	0	0	100	0	0	0	100
<i>Allocasuarina verticillata</i> forest	0	0	0	100	0	0	0	100	0	0	0	100
<i>Banksia serrata</i> woodland	0	0	0	100	0	0	0	100	0	0	0	100
Callidendrous and thamnic rainforest on fertile sites	0	0	0	100	0	0	0	100	0	0	0	100
<i>Callitris rhomboidea</i> forest	0	0	0	100	0	0	0	100	0	0	0	100
Huon pine forest	0	0	0	100	0	0	0	100	0	0	0	100
King Billy pine forest	0	0	0	100	0	0	0	100	0	0	0	100
King Billy pine with deciduous beech	0	0	0	100	0	0	0	100	0	0	0	100
<i>Leptospermum sp./Melaleuca squarrosa</i> swamp forest	0	0	0	100	0	0	0	100	0	0	0	100
<i>Melaleuca ericifolia</i> forest	0	0	0	100	0	0	0	100	0	0	0	100
<i>Notelaea ligustrina</i> and/or <i>Pomaderris apetala</i> forest	0	0	0	100	0	0	0	100	0	0	0	100
Pencil pine forest	0	0	0	100	0	0	0	100	0	0	0	100
Pencil pine with deciduous beech	0	0	0	100	0	0	0	100	0	0	0	100
Silver wattle ( <i>Acacia dealbata</i> )	0	0	0	100	0	0	0	100	0	0	0	100
Thamnic rainforest on less fertile sites	0	0	0	100	0	0	0	100	0	0	0	100
<b>TOTAL</b>	0	9	53	38	6	23	49	22	2	19	64	15

\* Non-eucalypt communities cannot readily be mapped by growth stage.

**Table 1.1.b(iii) Changes in distribution of growth stages of each forest type**

(Figures are the area of each growth stage expressed as a percentage of the total area of that forest type)

RFA Forest Vegetation Community	Distribution in 1996 (%)				Distribution in 2005 (%)				Change in percentage points since 1996 (b)			
	RN %	RG %	MO %	UNK %	RN %	RG %	MO %	UNK %	RN %	RG %	MO %	UNK %
<b>Dry eucalypt forest</b>												
Coastal <i>E. amygdalina</i> dry forest	2	10	88	0	2	9	79	10	1	-1	-9	10
Dry <i>E. delegatensis</i> forest	4	16	81	0	4	17	71	8	0	1	-10	8
Dry <i>E. nitida</i> forest	0	23	77	0	0	22	77	0	0	-1	0	0
Dry <i>E. obliqua</i> forest	6	23	70	0	5	26	66	4	-2	3	-5	3
<i>E. amygdalina</i> on dolerite	2	12	86	0	2	12	77	9	0	0	-9	9
<i>E. amygdalina</i> on sandstone	3	13	85	0	2	14	80	4	-1	2	-4	4
<i>E. morrisbyi</i> forest	0	0	100	0	0	0	100	0	0	0	0	0
<i>E. pauciflora</i> on dolerite	0	14	86	0	3	11	68	18	2	-3	-18	18
<i>E. pauciflora</i> on sediments	0	10	90	0	3	9	77	12	2	-1	-13	12
<i>E. pulchella/globulus/viminalis</i> grassy shrubby dry forest	1	11	88	0	2	12	85	1	1	0	-2	1
<i>E. risdonii</i> forest	0	81	19	0	0	81	19	0	0	0	0	0
<i>E. rodwayi</i> forest	0	17	83	0	3	16	65	16	3	-1	-19	16
<i>E. sieberi</i> forest on granite	3	5	92	0	5	7	83	5	2	2	-9	5
<i>E. sieberi</i> on other substrates	8	9	82	1	9	8	81	2	1	-1	-1	2
<i>E. tenuiramis</i> on dolerite	4	9	87	0	2	12	86	0	-2	3	-1	0
<i>E. tenuiramis</i> on granite	0	1	99	0	0	0	100	0	0	-1	1	0
<i>E. viminalis</i> and/or <i>E. globulus</i> coastal shrubby forest	0	4	96	0	0	5	95	0	0	0	0	0
<i>E. viminalis/ovata/amygdalina/obliqua</i> damp forest	5	34	61	0	5	34	52	9	0	0	-9	9
Furneaux <i>E. nitida</i> forest	0	2	98	0	0	2	98	0	0	0	0	0
Furneaux <i>E. viminalis</i> forest	0	0	100	0	0	0	100	0	0	0	0	0
Grassy <i>E. globulus</i> forest	0	14	86	0	0	13	86	1	0	-1	0	1
Grassy <i>E. viminalis</i> forest	1	11	88	0	1	11	81	7	1	0	-7	7
Inland <i>E. amygdalina</i> forest	0	22	78	0	0	18	75	7	0	-4	-3	7
Inland <i>E. tenuiramis</i> forest	0	25	75	0	0	25	74	1	0	0	-1	1
Shrubby <i>E. ovata</i> forest	0	35	64	0	2	30	50	18	2	-5	-14	18

RFA Forest Vegetation Community	Distribution in 1996 (%)				Distribution in 2005 (%)				Change in percentage points since 1996 (b)			
	RN %	RG %	MO %	UNK %	RN %	RG %	MO %	UNK %	RN %	RG %	MO %	UNK %
<b>Wet eucalypt forest</b>												
<i>E. brookeriana</i> wet forest	1	35	64	0	3	35	58	5	2	0	-6	5
<i>E. regnans</i> forest	8	45	47	1	7	48	43	2	0	3	-4	2
King Island <i>E. globulus</i> / <i>brookeriana/viminalis</i> forest	0	63	37	0	0	63	37	0	0	0	0	0
Tall <i>E. delegatensis</i> forest	5	22	72	0	6	22	68	5	1	-1	-4	5
Tall <i>E. nitida</i> forest	0	18	82	0	0	18	82	0	0	0	0	0
Tall <i>E. obliqua</i> forest	8	41	52	0	7	40	51	3	-1	-1	-1	2
Wet <i>E. viminalis</i> on basalt	0	42	57	0	1	41	41	17	0	-1	-16	17
<b>Sub-alpine eucalypt forest</b>												
<i>E. coccifera</i> dry forest	0	19	81	0	0	20	70	10	0	1	-11	10
<i>E. subcrenulata</i> forest	1	18	81	0	1	18	80	1	0	0	-1	1
<b>Non-eucalypt forest (a)</b>												
<i>Acacia melanoxylon</i> on flats	0	0	0	100	0	0	0	100	0	0	0	100
<i>Acacia melanoxylon</i> on rises	0	0	0	100	0	0	0	100	0	0	0	100
<i>Allocasuarina verticillata</i> forest	0	0	0	100	0	0	0	100	0	0	0	100
<i>Banksia serrata</i> woodland	0	0	0	100	0	0	0	100	0	0	0	100
Callidendrous and thamnic rainforest on fertile sites	0	0	0	100	0	0	0	100	0	0	0	100
<i>Callitris rhomboidea</i> forest	0	0	0	100	0	0	0	100	0	0	0	100
Huon pine forest	0	0	0	100	0	0	0	100	0	0	0	100
King Billy pine forest	0	0	0	100	0	0	0	100	0	0	0	100
King Billy pine with deciduous beech	0	0	0	100	0	0	0	100	0	0	0	100
<i>Leptospermum</i> sp./ <i>Melaleuca squarrosa</i> swamp forest	0	0	0	100	0	0	0	100	0	0	0	100
<i>Melaleuca ericifolia</i> forest	0	0	0	100	0	0	0	100	0	0	0	100
<i>Notelaea ligustrina</i> and/or <i>Pomaderris</i> <i>apetala</i> forest	0	0	0	100	0	0	0	100	0	0	0	100
Pencil pine forest	0	0	0	100	0	0	0	100	0	0	0	100
Pencil pine with deciduous beech	0	0	0	100	0	0	0	100	0	0	0	100
Silver wattle ( <i>Acacia dealbata</i> )	0	0	0	100	0	0	0	100	0	0	0	100
Thamnic rainforest on less fertile sites	0	0	0	100	0	0	0	100	0	0	0	100

Notes: (a) Non-eucalypt communities cannot readily be mapped by growth stage.  
(b) Figures are the actual percentage change which have then been rounded.

Table 1.1.c (i) Area of native forest type protected by IUCN category (a)

RFA Forest Vegetation Community Grouping	IUCN Category								TOTAL
	Ia	II	II/lb	III	IV	V	VI	Not Classified <sup>(b)</sup>	
<b>Dry eucalypt forests</b>									
Coastal <i>E. amygdalina</i> dry sclerophyll forest	200	20 000	200	2 000	900	1 000	23 000	23 000	<b>71 000</b>
Dry <i>E. delegatensis</i> forest	50	15 000	23 000	700	1 000	3 000	23 000	37 000	<b>103 000</b>
Dry <i>E. nitida</i> forest	0	4 000	90 000	0	50	4 000	36 000	9 000	<b>142 000</b>
Dry <i>E. obliqua</i> forest	500	10 000	5 000	1 000	800	2 000	13 000	25 000	<b>58 000</b>
<i>E. amygdalina</i> forest on dolerite	600	3 000	400	200	2 000	300	4 000	24 000	<b>35 000</b>
<i>E. amygdalina</i> forest on sandstone	300	50	0	0	70	100	4 000	4 000	<b>8 000</b>
<i>E. morrisbyi</i> forest	20	0	0	0	0	0	0	0	<b>20</b>
<i>E. pauciflora</i> on Jurassic dolerite	0	0	0	200	100	200	700	2 000	<b>4 000</b>
<i>E. pauciflora</i> on sediments	200	0	3 000	0	90	0	900	2 000	<b>6 000</b>
<i>E. pulchella</i> / <i>globulus</i> / <i>viminalis</i> grassy shrubby dry sclerophyll forest	6 000	7 000	0	3 000	7 000	800	2 000	22 000	<b>47 000</b>
<i>E. risdonii</i> forest	0	30	0	0	0	100	0	0	<b>200</b>
<i>E. rodwayi</i> forest	30	0	10	0	0	10	40	900	<b>1 000</b>
<i>E. sieberi</i> forest on granite	0	300	0	2 000	40	200	90	3 000	<b>5 000</b>
<i>E. sieberi</i> on other substrates	10	2 000	0	100	800	0	30	10 000	<b>12 000</b>
<i>E. tenuiramis</i> on dolerite	0	2 000	0	100	0	0	300	4 000	<b>6 000</b>
<i>E. tenuiramis</i> on granite	0	2 000	0	0	0	0	1 000	60	<b>3 000</b>
<i>E. viminalis</i> and/or <i>E. globulus</i> coastal shrubby forest	0	200	100	0	60	0	100	30	<b>500</b>
<i>E. viminalis</i> / <i>ovata</i> / <i>amygdalina</i> / <i>obliqua</i> damp sclerophyll forest	200	100	0	30	200	10	2 000	11 000	<b>13 000</b>
Furneaux <i>E. nitida</i> forest	2 000	4 000	0	0	20	400	13 000	200	<b>19 000</b>
Furneaux <i>E. viminalis</i> forest	0	0	0	0	0	0	100	0	<b>100</b>
Grassy <i>E. globulus</i> forest	30	4 000	0	0	500	400	1 000	200	<b>7 000</b>
Grassy <i>E. viminalis</i> forest	50	500	0	90	1 000	200	1 000	1 000	<b>5 000</b>
Inland <i>E. amygdalina</i> forest	400	80	0	70	2 000	300	2 000	1 000	<b>6 000</b>
Inland <i>E. tenuiramis</i> forest	2 000	400	0	100	3 000	500	4 000	1 000	<b>11 000</b>
Shrubby <i>E. ovata</i> forest	0	60	0	0	70	20	100	300	<b>500</b>
<b>Wet eucalypt forests</b>									
<i>E. brookeriana</i> wet forest	20	0	0	0	0	0	10	2 000	<b>2 000</b>
<i>E. regnans</i> forest	10	1 000	3 000	200	200	100	200	13 000	<b>18 000</b>
King Island <i>E. globulus</i> / <i>brookeriana</i> / <i>viminalis</i> forest	90	90	0	0	0	0	80	300	<b>600</b>

	IUCN Category								
Tall <i>E. delegatensis</i> forest	100	12 000	42 000	500	400	2 000	6 000	38 000	<b>101 000</b>
Tall <i>E. nitida</i> forest	0	500	49 000	10	40	300	16 000	3 000	<b>69 000</b>
Tall <i>E. obliqua</i> forest	500	10 000	23 000	1 000	1 000	7 000	18 000	66 000	<b>127 000</b>
Wet <i>E. viminalis</i> forest on basalt	300	20	0	10	30	0	10	500	<b>900</b>
<b>Sub-alpine eucalypt forests</b>									
<i>E. coccifera</i> dry forest	0	4 000	19 000	0	0	5 000	11 000	4 000	<b>43 000</b>
<i>E. subcrenulata</i> forest	0	400	7 000	0	0	0	100	1 000	<b>9 000</b>
<b>Non-eucalypt forests</b>									
<i>Acacia melanoxylon</i> forest on flats	70	300	20	0	200	0	10	2 000	<b>3 000</b>
<i>Acacia melanoxylon</i> forest on rises	10	0	30	20	30	90	2 000	2 000	<b>5 000</b>
<i>Allocasuarina verticillata</i> forest	0	500	0	30	10	0	50	20	<b>600</b>
<i>Banksia serrata</i> woodland	0	100	0	0	0	0	0	0	<b>100</b>
<i>Callidendrous</i> and thamnic rainforest on fertile sites	20	3 000	37 000	400	400	5 000	21 000	77 000	<b>144 000</b>
<i>Callitris rhomboidea</i> forest	100	100	0	40	10	0	50	100	<b>500</b>
Huon pine forest	0	500	6 000	10	0	90	1 000	200	<b>8 000</b>
King Billy pine forest	0	40	10 000	0	0	50	6 000	1 000	<b>18 000</b>
King Billy pine with deciduous beech	0	0	200	0	0	0	600	20	<b>800</b>
<i>Leptospermum</i> sp./ <i>Melaleuca squarrosa</i> swamp forest	70	10	7 000	10	0	1 000	700	2 000	<b>11 000</b>
<i>Melaleuca ericifolia</i> forest	0	200	0	0	0	0	200	0	<b>400</b>
<i>Notelaea ligustrina</i> and/or <i>Pomaderris apetala</i> forest	0	70	100	0	0	0	0	40	<b>200</b>
Pencil pine forest	0	0	300	0	0	0	0	0	<b>300</b>
Pencil pine with deciduous beech	0	0	200	0	0	0	0	0	<b>200</b>
Silver wattle ( <i>Acacia dealbata</i> ) forest	200	900	1 000	200	400	100	2 000	11 000	<b>15 000</b>
Thamnic rainforest on less fertile sites	20	5 000	164 000	90	70	11 000	76 000	70 000	<b>326 000</b>
<b>TOTAL</b>	<b>14 000</b>	<b>112 000</b>	<b>492 000</b>	<b>12 000</b>	<b>23 000</b>	<b>46 000</b>	<b>292 000</b>	<b>474 000</b>	<b>1 465 000</b>

(a) Forest extent is as at the first quarter of 2005 and IUCN categories are as at 3<sup>h</sup> June 2006

(b) The areas listed having a "Not Classified" IUCN category are other reserves within the CAR Reserve system

**Table 1.1.c (ii) Area of native forest type protected by reserve class (a)**

RFA Forest Vegetation Community	Public Land				Private Land		TOTAL (ha)
	Dedicated formal reserve (ha)	Other formal reserve Min (b) (ha)	Informal reserve (ha)	Other public land (ha)	Private CAR reserves (ha)	Other private land (ha)	
<b>Dry eucalypt forests</b>							
Coastal <i>E. amygdalina</i> forest	23 000	36 000	10 000	50 000	1 000	64 000	<b>185 000</b>
Dry <i>E. delegatensis</i> forest	39 000	33 000	26 000	91 000	5 000	93 000	<b>287 000</b>
Dry <i>E. nitida</i> forest	94 000	41 000	8 000	11 000	70	6 000	<b>159 000</b>
Dry <i>E. obliqua</i> forest	16 000	23 000	17 000	53 000	2 000	49 000	<b>159 000</b>
<i>E. amygdalina</i> on dolerite	4 000	16 000	11 000	15 000	3 000	126 000	<b>175 000</b>
<i>E. amygdalina</i> on sandstone	300	4 000	3 000	5 000	500	17 000	<b>30 000</b>
<i>E. morrisbyi</i> forest	20	0	0	0	0	0	<b>20</b>
<i>E. pauciflora</i> on dolerite	200	1 000	2 000	2 000	600	13 000	<b>19 000</b>
<i>E. pauciflora</i> on sediments	3 000	900	1 000	2 000	300	8 000	<b>16 000</b>
<i>E. pulchella/globulus/viminalis</i> grassy shrubby dry forest	16 000	10 000	14 000	12 000	8 000	90 000	<b>150 000</b>
<i>E. risdonii</i> forest	30	100	0	20	0	200	<b>400</b>
<i>E. rodwayi</i> forest	20	100	200	200	600	7 000	<b>9 000</b>
<i>E. sieberi</i> forest on granite	3 000	1 000	2 000	10 000	50	2 000	<b>18 000</b>
<i>E. sieberi</i> on other substrates	2 000	6 000	3 000	27 000	700	6 000	<b>46 000</b>
<i>E. tenuiramis</i> on dolerite	2 000	3 000	1 000	1 000	0	700	<b>8 000</b>
<i>E. tenuiramis</i> on granite	2 000	1 000	60	40	0	200	<b>3 000</b>
<i>E. viminalis</i> and/or <i>E. globulus</i> coastal shrubby forest	300	0	30	30	200	700	<b>1 000</b>
<i>E. viminalis/ovata/amygdalina/obliqua</i> damp forest	300	9 000	3 000	12 000	700	14 000	<b>38 000</b>
Furneaux <i>E. nitida</i> forest	9 000	10 000	200	5 000	50	6 000	<b>30 000</b>
Furneaux <i>E. viminalis</i> forest	0	100	0	0	0	20	<b>100</b>
Grassy <i>E. globulus</i> forest	4 000	2 000	200	700	600	7 000	<b>14 000</b>
Grassy <i>E. viminalis</i> forest	500	2 000	400	2 000	2 000	105 000	<b>112 000</b>
Inland <i>E. amygdalina</i> forest	1 000	800	400	2 000	3 000	17 000	<b>25 000</b>
Inland <i>E. tenuiramis</i> forest	3 000	5 000	700	1 000	3 000	42 000	<b>54 000</b>
Shrubby <i>E. ovata</i> forest	60	200	100	300	200	6 000	<b>7 000</b>

RFA Forest Vegetation Community	Public Land				Private Land		TOTAL (ha)
	Dedicated formal reserve (ha)	Other formal reserve Min (b) (ha)	Informal reserve (ha)	Other public land (ha)	Private CAR reserves (ha)	Other private land (ha)	
<b>Wet eucalypt forests</b>							
<i>E. brookeriana</i> wet forest	0	1 000	100	1 000	200	1 000	4 000
<i>E. regnans</i> forest	5 000	5 000	8 000	45 000	100	5 000	68 000
King Island <i>E. globulus/ brookeriana/viminalis</i> forest	100	50	300	200	90	2 000	2 000
Tall <i>E. delegatensis</i> forest	54 000	16 000	27 000	134 000	4 000	38 000	272 000
Tall <i>E. nitida</i> forest	50 000	16 000	2 000	5 000	20	700	74 000
Tall <i>E. obliqua</i> forest	35 000	45 000	44 000	206 000	3 000	63 000	396 000
Wet <i>E. viminalis</i> forest on basalt	30	700	100	500	90	2 000	4 000
<b>Sub-alpine eucalypt forests</b>							
<i>E. coccifera</i> dry forest	23 000	16 000	4 000	5 000	90	7 000	55 000
<i>E. subcrenulata</i> forest	8 000	200	1 000	1 000	0	20	10 000
<b>Non-eucalypt forests</b>							
<i>Acacia melanoxylon</i> on flats	600	2 000	400	5 000	100	2 000	9 000
<i>Acacia melanoxylon</i> on rises	50	3 000	1 000	5 000	400	3 000	13 000
<i>Allocasuarina verticillata</i> forest	500	70	20	90	20	700	1 000
<i>Banksia serrata</i> woodland	100	0	0	0	0	40	200
Callidendrous and thamnic rainforest on fertile sites	41 000	52 000	48 000	35 000	3 000	8 000	186 000
<i>Callitris rhomboidea</i> forest	300	60	100	20	10	300	800
Huon pine forest	6 000	1 000	100	1 000	10	0	9 000
King Billy pine forest	10 000	6 000	1 000	2 000	10	0	20 000
King Billy pine with deciduous beech	200	600	20	50	0	0	800
<i>Leptospermum sp./Melaleuca squarrosa</i> swamp forest	7 000	2 000	1 000	3 000	300	5 000	19 000
<i>Melaleuca ericifolia</i> forest	200	200	0	70	0	100	600
<i>Notelaea ligustrina</i> and/or <i>Pomaderris apetala</i> forest	200	10	20	20	0	40	300
Pencil pine forest	300	0	0	0	0	0	300
Pencil pine with deciduous beech	200	0	0	0	0	0	200
Silver wattle ( <i>Acacia dealbata</i> ) forest	2 000	6 000	6 000	20 000	1 000	15 000	50 000
Thamnic rainforest on less fertile sites	169 000	99 000	54 000	43 000	4 000	7 000	376 000
<b>TOTAL</b>	<b>635 000</b>	<b>479 000</b>	<b>303 000</b>	<b>814 000</b>	<b>48 000</b>	<b>838 000</b>	<b>3 116 000</b>

(a) Forest extent is as at the first quarter of 2005 and reserve classes are as at 30 June 2006

(b) Subject to the Mineral Resources Development Act 1995.

Table 1.1c (iii) Change in reservation status of forest types (a)

RFA Forest Vegetation Community	Forest in 1996		Forest in 2005			Change in proportion reserved since RFA (1996) (percentage points)
	Total area (ha)	Percentage of forest then in reserves (%)	Total area (ha)	Area in CAR reserves (ha)	Percentage of existing forest now in reserves (%)	
<b>Dry eucalypt forests</b>						
Coastal <i>E. amygdalina</i> dry forest	190 000	17.1	185 000	71 000	38.3	21.2
Dry <i>E. delegatensis</i> forest	290 000	25.8	287 000	103 000	35.8	10.0
Dry <i>E. nitida</i> forest	160 000	75.6	159 000	142 000	89.3	13.7
Dry <i>E. obliqua</i> forest	164 000	22.5	159 000	58 000	36.1	13.6
<i>E. amygdalina</i> on dolerite	178 000	7.7	175 000	35 000	19.8	12.1
<i>E. amygdalina</i> on sandstone	30 000	6.0	30 000	8 000	27.8	21.8
<i>E. morrisbyi</i> forest	20	0.0	20	20	93.6	93.6
<i>E. pauciflora</i> on dolerite	19 000	12.5	19 000	4 000	18.9	6.4
<i>E. pauciflora</i> on sediments	16 000	24.1	16 000	6 000	34.5	10.4
<i>E. pulchella/globulus/viminalis</i> grassy shrubby dry forest	151 000	9.2	150 000	47 000	31.6	22.4
<i>E. risdonii</i> forest	400	44.5	400	200	44.6	0.1
<i>E. rodwayi</i> forest	9 000	3.2	9 000	1 000	11.5	8.3
<i>E. sieberi</i> forest on granite	18 000	12.4	18 000	5 000	31.3	18.9
<i>E. sieberi</i> on other substrates	46 000	13.7	46 000	12 000	27.0	13.3
<i>E. tenuiramis</i> on dolerite	8 000	42.4	8 000	6 000	75.8	33.4
<i>E. tenuiramis</i> on granite	3 000	43.6	3 000	3 000	93.3	49.7
<i>E. viminalis</i> and/or <i>E. globulus</i> coastal shrubby forest	1 000	23.0	1 000	500	37.2	14.2
<i>E. viminalis/ovata/amygdalina/ obliqua</i> damp forest	41 000	16.0	38 000	13 000	33.9	17.9
Furneaux <i>E. nitida</i> forest	30 000	18.6	30 000	19 000	63.0	44.4
Furneaux <i>E. viminalis</i> forest	100	0.0	100	100	87.2	87.2
Grassy <i>E. globulus</i> forest	14 000	29.2	14 000	7 000	47.4	18.2
Grassy <i>E. viminalis</i> forest	113 000	1.2	112 000	5 000	4.4	3.2
Inland <i>E. amygdalina</i> forest	26 000	5.4	25 000	6 000	24.9	19.5
Inland <i>E. tenuiramis</i> forest	55 000	5.9	54 000	11 000	20.4	14.5
Shrubby <i>E. ovata</i> forest	7 000	3.7	7 000	500	7.8	4.1
<b>Wet eucalypt forests</b>						
<i>E. brookeriana</i> wet forest	5 000	5.9	4 000	2 000	37.3	31.4
<i>E. regnans</i> forest	76 000	17.6	68 000	18 000	27.1	9.5
King Island <i>E. globulus/ brookeriana/viminalis</i> forest	2 000	5.2	2 000	600	25.0	19.8
Tall <i>E. delegatensis</i> forest	286 000	26.3	272 000	101 000	37.0	10.7

RFA Forest Vegetation Community	Forest in 1996		Forest in 2005			Change in proportion reserved since RFA (1996) (percentage points)
	Total area (ha)	Percentage of forest then in reserves (%)	Total area (ha)	Area in CAR reserves (ha)	Percentage of existing forest now in reserves (%)	
Tall <i>E. nitida</i> forest	74 000	86.1	74 000	69 000	92.5	6.4
Tall <i>E. obliqua</i> forest	426 000	17.9	396 000	127 000	32.0	14.1
Wet <i>E. viminalis</i> forest on basalt	4 000	7.6	4 000	900	24.3	16.7
<b>Sub-alpine eucalypt forests</b>						
<i>E. coccifera</i> dry forest	55 000	69.1	55 000	43 000	78.2	9.1
<i>E. subcrenulata</i> forest	10 000	83.2	10 000	9 000	86.3	3.1
<b>Non-eucalypt forests</b>						
<i>Acacia melanoxylon</i> on flats	9 000	10.7	9 000	3 000	31.2	20.5
<i>Acacia melanoxylon</i> on rises	13 000	9.9	13 000	5 000	39.2	29.3
<i>Allocasuarina verticillata</i> forest	1 000	36.9	1 000	600	45.8	8.9
<i>Banksia serrata</i> woodland	200	73.8	200	100	74.3	0.5
Callidendrous and thamnic rainforest on fertile sites	192 000	45.1	186 000	144 000	77.1	32.0
<i>Callitris rhomboidea</i> forest	800	32.9	800	500	63.1	30.2
Huon Pine forest	9 000	77.4	9 000	8 000	85.3	7.9
King Billy Pine forest	20 000	82.0	20 000	18 000	89.5	7.5
King Billy Pine with deciduous beech	800	78.5	800	800	93.8	15.3
<i>Leptospermum sp./Melaleuca squarrosa</i> swamp forest	19 000	45.3	19 000	11 000	60.5	15.2
<i>Melaleuca ericifolia</i> forest	600	36.7	600	400	67.0	30.3
<i>Notelaea ligustrina</i> and/or <i>Pomaderris apetala</i> forest	300	65.9	300	200	80.0	14.1
Pencil Pine forest	300	99.9	300	300	99.9	0.0
Pencil Pine with deciduous beech	200	100.0	200	200	100.0	0.0
Silver wattle ( <i>Acacia dealbata</i> ) forest	54 000	18.0	50 000	15 000	30.4	12.4
Thamnic rainforest on less fertile sites	378 000	61.3	376 000	326 000	86.8	25.5
<b>TOTAL</b>	<b>3 207 000</b>	<b>30.5</b>	<b>3 116 000</b>	<b>1 465 000</b>	<b>47.0</b>	<b>16.5</b>

(a) Forest extent is as at the first quarter of 2005 and reserve classes are as at 30 June 2006

**Table 1.1.c (iv) Reservation status of native forest types by IBRA 4 biogeographic regions (a)**

RFA Forest Vegetation Community	Furneaux Region			Woolnorth Region		
	Total area (ha)	Area reserved (ha)	Percentage reserved (%)	Total area (ha)	Area reserved (ha)	Percentage reserved (%)
Coastal <i>E. amygdalina</i> dry forest	0	0	n/a	24 000	8 000	34.1
Dry <i>E. delegatensis</i> forest	0	0	n/a	4 000	2 000	60.2
Dry <i>E. nitida</i> forest	0	0	n/a	14 000	6 000	43.9
Dry <i>E. obliqua</i> forest	0	0	n/a	28 000	10 000	35.0
<i>E. amygdalina</i> forest on dolerite	0	0	n/a	17 000	2 000	10.2
<i>E. amygdalina</i> forest on sandstone	0	0	n/a	300	20	6.5
<i>E. morrisbyi</i> forest	0	0	n/a	0	0	n/a
<i>E. pauciflora</i> on dolerite	0	0	n/a	0	0	n/a
<i>E. pauciflora</i> on sediments	0	0	n/a	0	0	n/a
<i>E. pulchella/globulus/viminalis</i> grassy shrubby dry forest	0	0	n/a	0	0	n/a
<i>E. risdonii</i> forest	0	0	n/a	0	0	n/a
<i>E. rodwayi</i> forest	0	0	n/a	100	100	94.5
<i>E. sieberi</i> forest on granite	0	0	n/a	0	0	n/a
<i>E. sieberi</i> on other substrates	0	0	n/a	0	0	n/a
<i>E. tenuiramis</i> on dolerite	0	0	n/a	0	0	n/a
<i>E. tenuiramis</i> on granite	0	0	n/a	0	0	n/a
<i>E. viminalis</i> and/or <i>E. globulus</i> coastal shrubby forest	0	0	n/a	10	0	0.0
<i>E. viminalis/ovata/amygdalina/obliqua</i> damp forest	0	0	n/a	28 000	10 000	36.5
Furneaux <i>E. nitida</i> forest	30 000	19 000	63.0	0	0	n/a
Furneaux <i>E. viminalis</i> forest	100	100	87.2	0	0	n/a
Grassy <i>E. globulus</i> forest	0	0	n/a	0	0	n/a
Grassy <i>E. viminalis</i> forest	0	0	n/a	3 000	200	5.5
Inland <i>E. amygdalina</i> forest	0	0	n/a	900	0	0.0
Inland <i>E. tenuiramis</i> forest	0	0	n/a	0	0	n/a
Shrubby <i>E. ovata</i> forest	0	0	n/a	3 000	200	8.4

**Table 1.1.c(iv) Continued**

<i>E. brookeriana</i> wet forest	0	0	n/a	4 000	2 000	37.5
<i>E. regnans</i> forest	0	0	n/a	2 000	800	33.1
King Island <i>E. globulus/brookeriana/ viminalis</i> forest	0	0	n/a	2 000	600	24.9
Tall <i>E. delegatensis</i> forest	0	0	n/a	13 000	6 000	44.6
Tall <i>E. nitida</i> forest	0	0	n/a	3 000	1 000	43.4
Tall <i>E. obliqua</i> forest	0	0	n/a	114 000	25 000	22.1
Wet <i>E. viminalis</i> forest on basalt	0	0	n/a	2 000	800	34.4
<i>E. coccifera</i> dry forest	0	0	n/a	30	20	57.5
<i>E. subcrenulata</i> forest	0	0	n/a	100	100	100.0
<i>Acacia melanoxylon</i> forest on flats	0	0	n/a	8 000	2 000	30.3
<i>Acacia melanoxylon</i> forest on rises	0	0	n/a	7 000	1 000	18.7
<i>Allocasuarina verticillata</i> forest	200	60	34.3	200	200	95.5
<i>Banksia serrata</i> woodland	0	0	n/a	200	100	74.3
Callidendrous and thamnic rainforest on fertile sites	0	0	n/a	26 000	17 000	63.0
<i>Callitris rhomboidea</i> forest	100	100	78.3	0	0	n/a
Huon pine forest	0	0	n/a	0	0	n/a
King Billy pine forest	0	0	n/a	10	10	100.0
King Billy pine with deciduous beech	0	0	n/a	0	0	n/a
<i>Leptospermum sp./Melaleuca squarrosa</i> swamp forest	300	0	0.6	7 000	1 000	17.3
<i>Melaleuca ericifolia</i> forest	10	10	98.4	200	200	96.5
<i>Notelaea ligustrina</i> and/or <i>Pomaderris apetala</i> forest	0	0	n/a	40	0	7.1
Pencil pine forest	0	0	n/a	0	0	n/a
Pencil pine with deciduous beech	0	0	n/a	0	0	n/a
Silver wattle ( <i>Acacia dealbata</i> ) forest	0	0	n/a	16 000	5 000	30.9
Thamnic rainforest on less fertile sites	0	0	n/a	25 000	12 000	50.1
<b>TOTAL</b>	<b>31 000</b>	<b>19 000</b>	<b>62.5</b>	<b>354 000</b>	<b>114 000</b>	<b>32.4</b>

Table 1.1.c(iv) Continued

RFA Forest Vegetation Community	Ben Lomond Region			Freycinet Region		
	Total area (ha)	Area reserved (ha)	Percentage reserved (%)	Total area (ha)	Area reserved (ha)	Percentage reserved (%)
Coastal <i>E. amygdalina</i> dry forest	129 000	48 000	37.5	28 000	13 000	46.6
Dry <i>E. delegatensis</i> forest	29 000	10 000	34.3	66 000	15 000	23.3
Dry <i>E. nitida</i> forest	0	0	n/a	0	0	n/a
Dry <i>E. obliqua</i> forest	28 000	7 000	26.3	30 000	11 000	35.8
<i>E. amygdalina</i> forest on dolerite	42 000	6 000	14.0	70 000	23 000	32.8
<i>E. amygdalina</i> forest on sandstone	1 000	200	15.8	24 000	7 000	29.6
<i>E. morrisbyi</i> forest	0	0	n/a	0	0	n/a
<i>E. pauciflora</i> on dolerite	0	0	n/a	1 000	800	61.6
<i>E. pauciflora</i> on sediments	2 000	900	47.9	50	0	0.0
<i>E. pulchella/globulus/viminalis</i> grassy shrubby dry forest	0	0	n/a	109 000	40 000	37.1
<i>E. risdonii</i> forest	0	0	n/a	0	0	n/a
<i>E. rodwayi</i> forest	40	0	0.5	2 000	20	1.1
<i>E. sieberi</i> forest on granite	17 000	5 000	29.6	800	500	65.6
<i>E. sieberi</i> on other substrates	43 000	11 000	25.6	3 000	1 000	47.7
<i>E. tenuiramis</i> on dolerite	0	0	n/a	8 000	6 000	77.2
<i>E. tenuiramis</i> on granite	0	0	n/a	3 000	3 000	93.2
<i>E. viminalis</i> and/or <i>E. globulus</i> coastal shrubby forest	0	0	n/a	1 000	300	33.7
<i>E. viminalis/ovata/amygdalina/obliqua</i> damp forest	2 000	800	40.2	0	0	n/a
Furneaux <i>E. nitida</i> forest	0	0	n/a	0	0	n/a
Furneaux <i>E. viminalis</i> forest	0	0	n/a	0	0	n/a
Grassy <i>E. globulus</i> forest	0	0	n/a	11 000	6 000	52.4
Grassy <i>E. viminalis</i> forest	19 000	1 000	6.8	21 000	1 000	4.5
Inland <i>E. amygdalina</i> forest	4 000	1 000	26.0	600	300	62.1
Inland <i>E. tenuiramis</i> forest	0	0	n/a	2 000	600	26.4
Shrubby <i>E. ovata</i> forest	400	70	16.4	700	100	15.3

**Table 1.1.c(iv) Continued**

<i>E. brookeriana</i> wet forest	0	0	n/a	20	0	8.8
<i>E. regnans</i> forest	23 000	7 000	28.7	3 000	900	29.3
King Island <i>E. globulus/brookeriana/ viminalis</i> forest	0	0	n/a	0	0	n/a
Tall <i>E. delegatensis</i> forest	45 000	9 000	19.5	21 000	7 000	34.0
Tall <i>E. nitida</i> forest	0	0	n/a	0	0	n/a
Tall <i>E. obliqua</i> forest	46 000	10 000	20.7	29 000	11 000	38.4
Wet <i>E. viminalis</i> forest on basalt	90	0	0.0	800	50	6.2
<i>E. coccifera</i> dry forest	30	30	102.2	80	10	7.7
<i>E. subcrenulata</i> forest	0	0	n/a	0	0	n/a
<i>Acacia melanoxylon</i> forest on flats	300	20	6.5	0	0	n/a
<i>Acacia melanoxylon</i> forest on rises	30	0	3.2	0	0	n/a
<i>Allocasuarina verticillata</i> forest	300	50	17.7	500	300	65.4
<i>Banksia serrata</i> woodland	0	0	n/a	0	0	n/a
Callidendrous and thamnic rainforest on fertile sites	25 000	16 000	66.8	600	600	90.1
<i>Callitris rhomboidea</i> forest	0	0	n/a	700	400	59.9
Huon Pine forest	0	0	n/a	0	0	n/a
King Billy Pine forest	0	0	n/a	0	0	n/a
King Billy Pine with deciduous beech	0	0	n/a	0	0	n/a
<i>Leptospermum sp./Melaleuca squarrosa</i> swamp forest	40	40	97.2	80	30	42.1
<i>Melaleuca ericifolia</i> forest	400	200	51.0	0	0	n/a
<i>Notelaea ligustrina</i> and/or <i>Pomaderris apetala</i> forest	20	10	66.8	20	20	100.0
Pencil Pine forest	0	0	n/a	0	0	n/a
Pencil Pine with deciduous beech	0	0	n/a	0	0	n/a
Silver wattle ( <i>Acacia dealbata</i> ) forest	20 000	5 000	26.1	2 000	800	39.7
Thamnic rainforest on less fertile sites	50	0	0.0	0	0	n/a
<b>TOTAL</b>	<b>475 000</b>	<b>138 000</b>	<b>29.2</b>	<b>440 000</b>	<b>151 000</b>	<b>34.3</b>

Table 1.1.c(iv) Continued

RFA Forest Vegetation Community	Midlands Region			Central Highlands Region		
	Total area (ha)	Area reserved (ha)	Percentage reserved (%)	Total area (ha)	Area reserved (ha)	Percentage reserved (%)
Coastal <i>E. amygdalina</i> dry forest	3 000	700	23.1	300	200	71.1
Dry <i>E. delegatensis</i> forest	10 000	2 000	19.2	163 000	61 000	37.6
Dry <i>E. nitida</i> forest	10	0	0.0	6 000	5 000	96.6
Dry <i>E. obliqua</i> forest	13 000	3 000	21.6	6 000	1 000	19.6
<i>E. amygdalina</i> forest on dolerite	40 000	3 000	7.6	5 000	1 000	19.5
<i>E. amygdalina</i> forest on sandstone	4 000	900	24.1	50	0	0.0
<i>E. morrisbyi</i> forest	20	20	93.6	0	0	n/a
<i>E. pauciflora</i> on dolerite	400	0	0.0	17 000	3 000	15.9
<i>E. pauciflora</i> on sediments	1 000	100	9.7	13 000	5 000	35.2
<i>E. pulchella/globulus/viminalis</i> grassy shrubby dry forest	27 000	4 000	15.2	2 000	400	22.7
<i>E. risdonii</i> forest	400	200	44.6	0	0	n/a
<i>E. rodwayi</i> forest	100	40	35.9	6 000	800	13.2
<i>E. sieberi</i> forest on granite	0	0	n/a	0	0	n/a
<i>E. sieberi</i> on other substrates	0	0	n/a	0	0	n/a
<i>E. tenuiramis</i> on dolerite	0	0	n/a	10	0	0.0
<i>E. tenuiramis</i> on granite	0	0	n/a	0	0	n/a
<i>E. viminalis</i> and/or <i>E. globulus</i> coastal shrubby forest	70	0	5.9	0	0	n/a
<i>E. viminalis/ovata/amygdalina/obliqua</i> damp forest	7 000	1 000	19.6	900	500	57.5
Furneaux <i>E. nitida</i> forest	0	0	n/a	0	0	n/a
Furneaux <i>E. viminalis</i> forest	0	0	n/a	0	0	n/a
Grassy <i>E. globulus</i> forest	3 000	900	32.8	0	0	n/a
Grassy <i>E. viminalis</i> forest	58 000	2 000	3.7	10 000	200	1.9
Inland <i>E. amygdalina</i> forest	19 000	5 000	24.7	0	0	n/a
Inland <i>E. tenuiramis</i> forest	33 000	8 000	23.2	17 000	2 000	13.9
Shrubby <i>E. ovata</i> forest	3 000	90	3.6	70	0	2.0

**Table 1.1.c(iv) Continued**

<i>E. brookeriana</i> wet forest	0	0	n/a	10	10	100.0
<i>E. regnans</i> forest	1 000	300	26.6	8 000	2 000	20.7
King Island <i>E. globulus/brookeriana/ viminalis</i> forest	0	0	n/a	0	0	n/a
Tall <i>E. delegatensis</i> forest	4 000	1 000	33.1	144 000	51 000	35.1
Tall <i>E. nitida</i> forest	0	0	n/a	2 000	2 000	94.8
Tall <i>E. obliqua</i> forest	8 000	2 000	22.7	13 000	4 000	30.8
Wet <i>E. viminalis</i> forest on basalt	60	0	0.0	400	30	7.4
<i>E. coccifera</i> dry forest	0	0	100.0	50 000	38 000	76.5
<i>E. subcrenulata</i> forest	10	10	100.0	4 000	3 000	91.2
<i>Acacia melanoxylon</i> forest on flats	0	0	n/a	0	0	n/a
<i>Acacia melanoxylon</i> forest on rises	0	0	n/a	200	70	45.8
<i>Allocasuarina verticillata</i> forest	300	40	15.3	0	0	n/a
<i>Banksia serrata</i> woodland	0	0	n/a	0	0	n/a
Callidendrous and thamnic rainforest on fertile sites	100	90	79.0	23 000	15 000	63.9
<i>Callitris rhomboidea</i> forest	0	0	n/a	0	0	n/a
Huon pine forest	0	0	n/a	0	0	n/a
King Billy pine forest	0	0	n/a	4 000	4 000	99.9
King Billy pine with deciduous beech	0	0	n/a	200	200	100.0
<i>Leptospermum sp./Melaleuca squarrosa</i> swamp forest	0	0	n/a	400	200	67.2
<i>Melaleuca ericifolia</i> forest	0	0	n/a	0	0	n/a
<i>Notelaea ligustrina</i> and/or <i>Pomaderris apetala</i> forest	30	30	79.5	0	0	0.0
Pencil pine forest	0	0	n/a	300	300	100.0
Pencil pine with deciduous beech	0	0	n/a	200	200	100.0
Silver wattle ( <i>Acacia dealbata</i> ) forest	2 000	600	30.0	7 000	3 000	44.2
Thamnic rainforest on less fertile sites	100	60	41.2	53 000	45 000	85.4
<b>TOTAL</b>	<b>239 000</b>	<b>35 000</b>	<b>14.8</b>	<b>555 000</b>	<b>248 000</b>	<b>44.6</b>

Table 1.1.c(iv) Continued

RFA Forest Vegetation Community	West & South West Region			D'Entrecasteaux Region		
	Total area (ha)	Area reserved (ha)	Percentage reserved (%)	Total area (ha)	Area reserved (ha)	Percentage reserved (%)
Coastal <i>E. amygdalina</i> dry forest	0	0	n/a	100	50	44.4
Dry <i>E. delegatensis</i> forest	6 000	6 000	91.0	8 000	6 000	78.1
Dry <i>E. nitida</i> forest	137 000	128 000	93.5	3 000	3 000	96.3
Dry <i>E. obliqua</i> forest	24 000	16 000	64.6	29 000	10 000	32.8
<i>E. amygdalina</i> forest on dolerite	0	0	n/a	200	10	3.6
<i>E. amygdalina</i> forest on sandstone	0	0	n/a	900	100	16.1
<i>E. morrisbyi</i> forest	0	0	n/a	0	0	n/a
<i>E. pauciflora</i> on dolerite	0	0	n/a	0	0	n/a
<i>E. pauciflora</i> on sediments	0	0	n/a	0	0	n/a
<i>E. pulchella/globulus/viminalis</i> grassy shrubby dry forest	0	0	n/a	12 000	2 000	19.4
<i>E. risdonii</i> forest	0	0	n/a	0	0	n/a
<i>E. rodwayi</i> forest	0	0	n/a	0	0	n/a
<i>E. sieberi</i> forest on granite	0	0	n/a	0	0	n/a
<i>E. sieberi</i> on other substrates	0	0	n/a	0	0	n/a
<i>E. tenuiramis</i> on dolerite	0	0	n/a	800	500	64.2
<i>E. tenuiramis</i> on granite	0	0	n/a	0	0	n/a
<i>E. viminalis</i> and/or <i>E. globulus</i> coastal shrubby forest	100	100	100.0	0	0	n/a
<i>E. viminalis/ovata/amygdalina/obliqua</i> damp forest	0	0	n/a	0	0	n/a
Furneaux <i>E. nitida</i> forest	0	0	n/a	0	0	n/a
Furneaux <i>E. viminalis</i> forest	0	0	n/a	0	0	n/a
Grassy <i>E. globulus</i> forest	0	0	n/a	500	100	22.0
Grassy <i>E. viminalis</i> forest	0	0	n/a	200	60	27.8
Inland <i>E. amygdalina</i> forest	0	0	n/a	0	0	n/a
Inland <i>E. tenuiramis</i> forest	0	0	n/a	2 000	400	23.3
Shrubby <i>E. ovata</i> forest	0	0	n/a	200	30	11.3

**Table 1.1.c(iv) Continued**

<i>E. brookeriana</i> wet forest	80	10	19.1	0	0	n/a
<i>E. regnans</i> forest	12 000	3 000	29.0	19 000	5 000	25.5
King Island <i>E. globulus/brookeriana/ viminalis</i> forest	0	0	n/a	0	0	n/a
Tall <i>E. delegatensis</i> forest	21 000	18 000	88.3	25 000	9 000	34.8
Tall <i>E. nitida</i> forest	67 000	64 000	95.1	2 000	2 000	74.6
Tall <i>E. obliqua</i> forest	80 000	46 000	57.0	107 000	30 000	27.9
Wet <i>E. viminalis</i> forest on basalt	0	0	n/a	0	0	n/a
<i>E. coccifera</i> dry forest	600	600	99.9	4 000	4 000	97.7
<i>E. subcrenulata</i> forest	2 000	2 000	90.4	4 000	3 000	79.3
<i>Acacia melanoxylon</i> forest on flats	800	400	48.0	0	0	n/a
<i>Acacia melanoxylon</i> forest on rises	5 000	3 000	69.3	0	0	n/a
<i>Allocasuarina verticillata</i> forest	0	0	n/a	0	0	n/a
<i>Banksia serrata</i> woodland	0	0	n/a	0	0	n/a
Callidendrous and thamnic rainforest on fertile sites	105 000	90 000	85.5	7 000	6 000	82.5
<i>Callitris rhomboidea</i> forest	0	0	n/a	0	0	n/a
Huon pine forest	9 000	8 000	85.3	40	40	94.5
King Billy pine forest	14 000	12 000	85.7	3 000	3 000	100.0
King Billy pine with deciduous beech	700	600	92.1	10	10	100.0
<i>Leptospermum sp./Melaleuca squarrosa</i> swamp forest	9 000	9 000	90.4	1 000	1 000	97.7
<i>Melaleuca ericifolia</i> forest	0	0	n/a	0	0	n/a
<i>Notelaea ligustrina</i> and/or <i>Pomaderris apetala</i> forest	100	100	100.0	50	40	98.7
Pencil pine forest	0	0	n/a	10	10	100.0
Pencil pine with deciduous beech	0	0	n/a	0	0	n/a
Silver wattle ( <i>Acacia dealbata</i> ) forest	600	300	61.2	4 000	600	16.0
Thamnic rainforest on less fertile sites	275 000	248 000	90.1	23 000	21 000	90.1
<b>TOTAL</b>	<b>769 000</b>	<b>654 000</b>	<b>85.0</b>	<b>256 000</b>	<b>106 000</b>	<b>41.3</b>

(a) Forest extent is as at the first quarter of 2005 and reserves are as at 30 June 2006

**Table 1.1.c (v) Change in reservation status of native forest types relative to their estimated 1750 extent (a)**

RFA Forest Vegetation Community	Estimated 1750 Extent (ha)	Reserved as at 1996		Reserved as at 2006		Change in proportion of 1750 Extent reserved (percentage points)
		Area reserved (ha)	Percentage of 1750 Extent (%)	Area reserved (ha)	Percentage of 1750 Extent (%)	
<b>Dry eucalypt forests</b>						
Coastal <i>E. amygdalina</i> dry forest	358 000	33 000	9.1	71 000	19.8	10.7
Dry <i>E. delegatensis</i> forest	318 000	75 000	23.5	103 000	32.3	8.8
Dry <i>E. nitida</i> forest	174 000	121 000	69.3	142 000	81.7	12.4
Dry <i>E. obliqua</i> forest	258 000	37 000	14.3	58 000	22.3	8.0
<i>E. amygdalina</i> on dolerite	248 000	14 000	5.5	35 000	14.0	8.5
<i>E. amygdalina</i> on sandstone	114 000	2 000	1.6	8 000	7.3	5.7
<i>E. morrisbyi</i> forest	300	0	0.0	20	7.0	7.0
<i>E. pauciflora</i> on dolerite	28 000	2 000	8.4	4 000	12.7	4.3
<i>E. pauciflora</i> on sediments	31 000	4 000	12.4	6 000	17.6	5.2
<i>E. pulchella/globulus/viminalis</i> grassy shrubby dry forest	219 000	14 000	6.4	47 000	21.6	15.2
<i>E. risdonii</i> forest	500	200	33.4	200	33.3	-0.1
<i>E. rodwayi</i> forest	12 000	300	2.3	1 000	8.3	6.0
<i>E. sieberi</i> forest on granite	19 000	2 000	11.3	5 000	28.3	17.0
<i>E. sieberi</i> on other substrates	52 000	6 000	12.1	12 000	23.6	11.5
<i>E. tenuiramis</i> on dolerite	9 000	4 000	40.1	6 000	71.3	31.2
<i>E. tenuiramis</i> on granite	3 000	1 000	41.1	3 000	87.9	46.8
<i>E. viminalis</i> and/or <i>E. globulus</i> coastal shrubby forest	5 000	300	6.0	500	9.6	3.6
<i>E. viminalis/ovata/amygdalina/obliqua</i> damp sclerophyll forest	89 000	7 000	7.3	13 000	14.5	7.2
Furneaux <i>E. nitida</i> forest	41 000	6 000	13.7	19 000	46.3	32.6
Furneaux <i>E. viminalis</i> forest	200	0	0.0	100	58.9	58.9
Grassy <i>E. globulus</i> forest	29 000	4 000	14.8	7 000	23.6	8.8
Grassy <i>E. viminalis</i> forest	243 000	1 000	0.6	5 000	2.0	1.4
Inland <i>E. amygdalina</i> forest	77 000	1 000	1.8	6 000	8.0	6.2
Inland <i>E. tenuiramis</i> forest	124 000	3 000	2.6	11 000	8.9	6.3
Shrubby <i>E. ovata</i> forest	232 000	300	0.1	500	0.2	0.1

**Table 1.1.c(v) Continued**

<b>Wet eucalypt forests</b>						
<i>E. brookeriana</i> wet forest	14 000	300	2.0	2 000	12.0	10.0
<i>E. regnans</i> forest	100 000	13 000	13.4	18 000	18.5	5.1
King Island <i>E. globulus</i> / <i>brookeriana/viminalis</i> forest	58 000	100	0.2	600	1.0	0.8
Tall <i>E. delegatensis</i> forest	317 000	75 000	23.7	101 000	31.8	8.1
Tall <i>E. nitida</i> forest	87 000	64 000	73.3	69 000	78.6	5.3
Tall <i>E. obliqua</i> forest	607 000	76 000	12.5	127 000	20.9	8.4
Wet <i>E. viminalis</i> forest on basalt	78 000	300	0.4	900	1.2	0.8
<b>Sub-alpine eucalypt forests</b>						
<i>E. coccifera</i> dry forest	59 000	38 000	63.7	43 000	72.0	8.3
<i>E. subcrenulata</i> forest	11 000	9 000	80.3	9 000	83.3	3.0
<b>Non-eucalypt forests</b>						
<i>Acacia melanoxylon</i> on flats	16 000	1 000	6.0	3 000	17.3	11.3
<i>Acacia melanoxylon</i> on rises	20 000	1 000	6.5	5 000	24.2	17.7
<i>Allocasuarina verticillata</i> forest	4 000	500	15.1	600	18.5	3.4
<i>Banksia serrata</i> woodland	200	100	58.4	100	58.7	0.3
Callidendrous and thamnic rainforest on fertile sites	213 000	87 000	40.7	144 000	67.6	26.9
<i>Callitris rhomboidea</i> forest	1 000	300	23.6	500	45.3	21.7
Huon pine forest	11 000	7 000	62.8	8 000	69.6	6.8
King Billy pine forest	20 000	17 000	82.6	18 000	90.8	8.2
King Billy pine with deciduous beech	800	700	82.9	800	99.1	16.2
<i>Leptospermum sp./Melaleuca squarrosa</i> swamp forest	41 000	9 000	21.0	11 000	27.8	6.8
<i>Melaleuca ericifolia</i> forest	20 000	200	1.1	400	2.0	0.9
<i>Notelaea ligustrina</i> and/or <i>Pomaderris apetala</i> forest	300	200	63.0	200	74.9	11.9
Pencil pine forest	700	300	49.7	300	49.7	0.0
Pencil pine with deciduous beech	300	200	64.0	200	64.0	0.0
Silver wattle ( <i>Acacia dealbata</i> ) forest	59 000	10 000	16.5	15 000	25.7	9.2
Thamnic rainforest on less fertile sites	401 000	232 000	57.8	326 000	81.3	23.5
<b>TOTAL</b>	<b>4 822 000</b>	<b>978 000</b>	<b>20.3</b>	<b>1 465 000</b>	<b>30.4</b>	<b>10.1</b>

(a) Forest extent is as at the first quarter of 2005 and reserves are as at 30 June 2006

**Table 1.1.e (i) Old Growth by forest type and tenure (a)**

RFA Forest Vegetation Community	Land Classification (Tenure)					% Change in area since RFA (1996)
	Conservation reserves (ha) (b)	Other State forest (ha) (c)	Other publicly managed land (ha)	Private freehold land (ha)	TOTAL (ha)	
<b>Dry eucalypt forests</b>						
Coastal <i>E. amygdalina</i> dry sclerophyll forest	23 000	4 000	1 000	11 000	<b>40 000</b>	-1.3
Dry <i>E. delegatensis</i> forest	40 000	26 000	2 000	10 000	<b>79 000</b>	-1.5
Dry <i>E. nitida</i> forest	94 000	9 000	400	3 000	<b>107 000</b>	-0.3
Dry <i>E. obliqua</i> forest	21 000	15 000	3 000	7 000	<b>46 000</b>	-2.1
<i>E. amygdalina</i> forest on dolerite	11 000	10 000	900	9 000	<b>30 000</b>	-1.2
<i>E. amygdalina</i> forest on sandstone	2 000	2 000	1 000	2 000	<b>7 000</b>	-0.1
<i>E. morrisbyi</i> forest	0	0	0	0	<b>0</b>	n/a
<i>E. pauciflora</i> on Jurassic dolerite	700	500	400	300	<b>2 000</b>	-0.2
<i>E. pauciflora</i> on sediments	2 000	1 000	200	500	<b>4 000</b>	-2.1
<i>E. pulchella</i> / <i>globulus</i> / <i>viminalis</i> grassy shrubby dry sclerophyll forest	19 000	6 000	8 000	30 000	<b>63 000</b>	-1.7
<i>E. risdonii</i> forest	0	0	0	10	<b>10</b>	0.0
<i>E. rodwayi</i> forest	100	60	0	500	<b>700</b>	-2.9
<i>E. sieberi</i> forest on granite	500	300	0	100	<b>1 000</b>	-0.2
<i>E. sieberi</i> on other substrates	400	800	10	400	<b>2 000</b>	-1.5
<i>E. tenuiramis</i> on dolerite	4 000	1 000	10	100	<b>5 000</b>	-1.0
<i>E. tenuiramis</i> on granite	3 000	0	40	100	<b>3 000</b>	-0.1
<i>E. viminalis</i> and/or <i>E. globulus</i> coastal shrubby forest	100	0	0	700	<b>900</b>	-0.5
<i>E. viminalis</i> / <i>ovata</i> / <i>amygdalina</i> / <i>obliqua</i> damp sclerophyll forest	1 000	900	90	300	<b>2 000</b>	-1.8
Furneaux <i>E. nitida</i> forest	0	0	0	0	<b>0</b>	n/a
Furneaux <i>E. viminalis</i> forest	0	0	0	0	<b>0</b>	n/a
Grassy <i>E. globulus</i> forest	4 000	100	60	800	<b>5 000</b>	-0.4
Grassy <i>E. viminalis</i> forest	800	200	0	7 000	<b>8 000</b>	-2.8
Inland <i>E. amygdalina</i> forest	500	70	100	2 000	<b>3 000</b>	-0.8
Inland <i>E. tenuiramis</i> forest	2 000	300	70	6 000	<b>8 000</b>	-1.1
Shrubby <i>E. ovata</i> forest	100	10	10	300	<b>500</b>	-2.3

<b>Wet eucalypt forests</b>						
<i>E. brookeriana</i> wet forest	200	50	0	300	<b>600</b>	-17.7
<i>E. regnans</i> forest	5 000	7 000	200	300	<b>12 000</b>	-9.5
King Island <i>E. globulus</i> / <i>brookeriana</i> / <i>viminalis</i> forest	0	0	0	0	<b>0</b>	n/a
Tall <i>E. delegatensis</i> forest	50 000	45 000	500	4 000	<b>100 000</b>	-4.4
Tall <i>E. nitida</i> forest	47 000	2 000	200	90	<b>50 000</b>	0.0
Tall <i>E. obliqua</i> forest	37 000	37 000	3 000	2 000	<b>79 000</b>	-5.5
Wet <i>E. viminalis</i> forest on basalt	90	10	0	20	<b>100</b>	-12.3
<b>Sub-alpine eucalypt forests</b>						
<i>E. coccifera</i> dry forest	27 000	3 000	1 000	2 000	<b>33 000</b>	-0.1
<i>E. subcrenulata</i> forest	6 000	1 000	0	10	<b>7 000</b>	-0.2
<b>Non-eucalypt forests</b>						
<i>Acacia melanoxylon</i> forest on flats	0	0	0	0	<b>0</b>	n/a
<i>Acacia melanoxylon</i> forest on rises	0	0	0	0	<b>0</b>	n/a
<i>Allocasuarina verticillata</i> forest	500	0	70	400	<b>1 000</b>	-0.8
<i>Banksia serrata</i> woodland	100	0	0	40	<b>200</b>	0.0
<i>Callidendrous</i> and thamnic rainforest on fertile sites	86 000	66 000	2 000	5 000	<b>158 000</b>	-0.7
<i>Callitris rhomboidea</i> forest	300	60	40	200	<b>600</b>	-1.7
Huon Pine forest	7 000	300	10	10	<b>8 000</b>	0.0
King Billy Pine forest	16 000	1 000	500	10	<b>17 000</b>	0.0
King Billy Pine with deciduous beech	300	20	10	0	<b>400</b>	0.0
<i>Leptospermum</i> sp./ <i>Melaleuca squarrosa</i> swamp forest	8 000	1 000	100	200	<b>10 000</b>	-0.8
<i>Melaleuca ericifolia</i> forest	200	0	60	50	<b>300</b>	0.0
<i>Notelaea ligustrina</i> and/or <i>Pomaderris apetala</i> forest	200	20	20	20	<b>300</b>	-1.9
Pencil Pine forest	300	0	0	0	<b>300</b>	0.0
Pencil Pine with deciduous beech	200	0	0	0	<b>200</b>	0.0
Silver wattle ( <i>Acacia dealbata</i> ) forest	0	0	0	0	<b>0</b>	n/a
Thamnic rainforest on less fertile sites	257 000	66 000	8 000	5 000	<b>335 000</b>	-0.2
<b>TOTAL</b>	<b>778 000</b>	<b>308 000</b>	<b>32 000</b>	<b>110 000</b>	<b>1 229 000</b>	<b>-1.4</b>

- (a) Forest extent is as at the first quarter of 2005 and tenure is as at 30 June 2006  
(b) Nature Conservation Act, Crown Lands Act, and Forest Reserves  
(c) Multiple-Use Forest

**Table 1.1.e (ii) Old Growth by forest type and reserve type (a)**

RFA Forest Vegetation Community	Public Land				Private Land		TOTAL (ha)
	Dedicated formal reserve (ha)	Other formal reserve Min (b) (ha)	Informal reserve (ha)	Other public land (ha)	Private CAR reserves (ha)	Other private land (ha)	
<b>Dry eucalypt forests</b>							
Coastal <i>E. amygdalina</i> forest	14 000	9 000	3 000	2 000	400	11 000	<b>40 000</b>
Dry <i>E. delegatensis</i> forest	23 000	17 000	13 000	16 000	500	9 000	<b>79 000</b>
Dry <i>E. nitida</i> forest	64 000	30 000	6 000	4 000	70	3 000	<b>107 000</b>
Dry <i>E. obliqua</i> forest	8 000	13 000	9 000	8 000	200	7 000	<b>46 000</b>
<i>E. amygdalina</i> on dolerite	2 000	9 000	8 000	2 000	200	9 000	<b>30 000</b>
<i>E. amygdalina</i> on sandstone	200	1 000	3 000	800	10	2 000	<b>7 000</b>
<i>E. morrisbyi</i> forest	0	0	0	0	0	0	<b>0</b>
<i>E. pauciflora</i> on dolerite	10	600	500	400	0	300	<b>2 000</b>
<i>E. pauciflora</i> on sediments	2 000	80	700	700	0	500	<b>4 000</b>
<i>E. pulchella/globulus/viminalis</i> grassy shrubby dry forest	12 000	7 000	11 000	3 000	3 000	27 000	<b>63 000</b>
<i>E. risdonii</i> forest	0	0	0	0	0	10	<b>10</b>
<i>E. rodwayi</i> forest	10	90	40	30	20	500	<b>700</b>
<i>E. sieberi</i> forest on granite	400	100	300	60	10	90	<b>1 000</b>
<i>E. sieberi</i> on other substrates	60	400	400	400	0	400	<b>2 000</b>
<i>E. tenuiramis</i> on dolerite	1 000	3 000	800	500	0	100	<b>5 000</b>
<i>E. tenuiramis</i> on granite	2 000	1 000	60	40	0	100	<b>3 000</b>
<i>E. viminalis</i> and/or <i>E. globulus</i> coastal shrubby forest	100	0	20	0	50	700	<b>900</b>
<i>E. viminalis/ovata/amygdalina/obliqua</i> damp forest	40	1 000	400	500	10	300	<b>2 000</b>
Furneaux <i>E. nitida</i> forest	0	0	0	0	0	0	<b>0</b>
Furneaux <i>E. viminalis</i> forest	0	0	0	0	0	0	<b>0</b>
Grassy <i>E. globulus</i> forest	3 000	500	80	90	100	700	<b>5 000</b>
Grassy <i>E. viminalis</i> forest	500	300	100	80	100	7 000	<b>8 000</b>
Inland <i>E. amygdalina</i> forest	400	50	80	200	300	2 000	<b>3 000</b>
Inland <i>E. tenuiramis</i> forest	900	1 000	200	200	700	5 000	<b>8 000</b>
Shrubby <i>E. ovata</i> forest	60	80	30	10	0	300	<b>500</b>

<b>Wet eucalypt forests</b>								
<i>E. brookeriana</i> wet forest	0	200	20	50	60	200		<b>600</b>
<i>E. regnans</i> forest	3 000	2 000	3 000	4 000	0	300		<b>12 000</b>
King Island <i>E. globulus/ brookeriana/viminalis</i> forest	0	0	0	0	0	0		<b>0</b>
Tall <i>E. delegatensis</i> forest	43 000	7 000	13 000	33 000	500	3 000		<b>100 000</b>
Tall <i>E. nitida</i> forest	34 000	13 000	1 000	1 000	10	80		<b>50 000</b>
Tall <i>E. obliqua</i> forest	18 000	18 000	16 000	24 000	400	2 000		<b>79 000</b>
Wet <i>E. viminalis</i> forest on basalt	0	90	0	10	0	20		<b>100</b>
<b>Sub-alpine eucalypt forests</b>								
<i>E. coccifera</i> dry forest	17 000	10 000	2 000	2 000	20	2 000		<b>33 000</b>
<i>E. subcrenulata</i> forest	6 000	100	700	700	0	10		<b>7 000</b>
<b>Non-eucalypt forests</b>								
<i>Acacia melanoxylon</i> on flats	0	0	0	0	0	0		<b>0</b>
<i>Acacia melanoxylon</i> on rises	0	0	0	0	0	0		<b>0</b>
<i>Allocasuarina verticillata</i> forest	500	40	10	50	20	400		<b>1 000</b>
<i>Banksia serrata</i> woodland	100	0	0	0	0	40		<b>200</b>
Callidendrous and thamnic rainforest on fertile sites	39 000	47 000	44 000	23 000	900	4 000		<b>158 000</b>
<i>Callitris rhomboidea</i> forest	200	30	90	10	10	200		<b>600</b>
Huon Pine forest	6 000	1 000	50	300	10	0		<b>8 000</b>
King Billy Pine forest	10 000	5 000	1 000	400	10	0		<b>17 000</b>
King Billy Pine with deciduous beech	200	200	20	10	0	0		<b>400</b>
<i>Leptospermum sp./Melaleuca squarrosa</i> swamp forest	7 000	900	800	600	40	200		<b>10 000</b>
<i>Melaleuca ericifolia</i> forest	0	200	0	60	0	50		<b>300</b>
<i>Notelaea ligustrina</i> and/or <i>Pomaderris apetala</i> forest	200	10	20	20	0	20		<b>300</b>
Pencil Pine forest	300	0	0	0	0	0		<b>300</b>
Pencil Pine with deciduous beech	200	0	0	0	0	0		<b>200</b>
Silver wattle ( <i>Acacia dealbata</i> ) forest	0	0	0	0	0	0		<b>0</b>
Thamnic rainforest on less fertile sites	165 000	91 000	49 000	24 000	1 000	4 000		<b>335 000</b>
<b>TOTAL</b>	<b>484 000</b>	<b>292 000</b>	<b>187 000</b>	<b>155 000</b>	<b>9 000</b>	<b>101 000</b>		<b>1 229 000</b>

- (a) Forest extent is as at the first quarter of 2005 and reserve classes are as at 30 June 2006  
(b) Subject to the *Mineral Resources Development Act 1995*.

Table 1.1.e (iii) Change in reservation status of old growth by forest type (a)

RFA Forest Vegetation Community	Extent of Old growth (ha)		Percentage of old growth now in reserves (%)	Change in proportion reserved since RFA (1996) (percentage points)
	Total area (ha)	Area in CAR reserves (ha)		
<b>Dry eucalypt forest</b>				
Coastal <i>E. amygdalina</i> dry forest	40 000	26 000	67.0	35.5
Dry <i>E. delegatensis</i> forest	79 000	54 000	68.2	18.0
Dry <i>E. nitida</i> forest	107 000	100 000	93.2	13.6
Dry <i>E. obliqua</i> forest	46 000	31 000	66.6	25.9
<i>E. amygdalina</i> on dolerite	30 000	19 000	62.8	43.8
<i>E. amygdalina</i> on sandstone	7 000	4 000	64.4	53.8
<i>E. morrisbyi</i> forest	0	0	n/a	n/a
<i>E. pauciflora</i> on dolerite	2 000	1 000	60.8	12.2
<i>E. pauciflora</i> on sediments	4 000	3 000	73.1	10.0
<i>E. pulchella/globulus/viminalis</i> grassy shrubby dry forest	63 000	33 000	52.8	38.5
<i>E. risdonii</i> forest	10	0	8.0	0.6
<i>E. rodwayi</i> forest	700	200	22.9	6.9
<i>E. sieberi</i> forest on granite	1 000	800	83.8	65.3
<i>E. sieberi</i> on other substrates	2 000	800	49.8	30.8
<i>E. tenuiramis</i> on dolerite	5 000	5 000	88.9	49.1
<i>E. tenuiramis</i> on granite	3 000	3 000	93.9	49.9
<i>E. viminalis</i> and/or <i>E. globulus</i> coastal shrubby forest	900	200	19.2	4.8
<i>E. viminalis/ovata/amygdalina/obliqua</i> damp forest	2 000	2 000	67.9	41.0
Furneaux <i>E. nitida</i> forest	0	0	n/a	n/a
Furneaux <i>E. viminalis</i> forest	0	0	n/a	n/a
Grassy <i>E. globulus</i> forest	5 000	4 000	84.0	28.7
Grassy <i>E. viminalis</i> forest	8 000	1 000	12.0	5.8
Inland <i>E. amygdalina</i> forest	3 000	900	30.1	25.1
Inland <i>E. tenuiramis</i> forest	8 000	3 000	35.6	25.3
Shrubby <i>E. ovata</i> forest	500	200	36.1	11.8

<b>Wet eucalypt forest</b>				
<i>E. brookeriana</i> wet forest	600	300	49.9	44.3
<i>E. regnans</i> forest	12 000	7 000	62.1	25.2
King Island <i>E. globulus/ brookeriana/viminalis</i> forest	0	0	n/a	n/a
Tall <i>E. delegatensis</i> forest	100 000	64 000	64.0	15.3
Tall <i>E. nitida</i> forest	50 000	48 000	97.3	6.0
Tall <i>E. obliqua</i> forest	79 000	53 000	66.6	32.0
Wet <i>E. viminalis</i> forest on basalt	100	90	73.0	29.0
<b>Sub-alpine eucalypt forest</b>				
<i>E. coccifera</i> dry forest	33 000	29 000	88.0	9.2
<i>E. subcrenulata</i> forest	7 000	7 000	90.0	2.5
<b>Non-eucalypt forest</b>				
<i>Acacia melanoxylon</i> on flats	0	0	n/a	n/a
<i>Acacia melanoxylon</i> on rises	0	0	n/a	n/a
<i>Allocasuarina verticillata</i> forest	1 000	500	56.4	10.4
<i>Banksia serrata</i> woodland	200	100	74.3	0.4
Callidendrous and thamnic rainforest on fertile sites	158 000	131 000	82.9	33.2
<i>Callitris rhomboidea</i> forest	600	400	60.0	21.7
Huon Pine forest	8 000	7 000	96.5	8.7
King Billy Pine forest	17 000	17 000	97.5	9.1
King Billy Pine with deciduous beech	400	400	97.0	5.2
<i>Leptospermum sp./Melaleuca squarrosa</i> swamp forest	10 000	9 000	91.5	15.0
<i>Melaleuca ericifolia</i> forest	300	200	65.1	55.7
<i>Notelaea ligustrina</i> and/or <i>Pomaderris apetala</i> forest	300	200	84.6	14.5
Pencil Pine forest	300	300	99.9	0.0
Pencil Pine with deciduous beech	200	200	100.0	0.0
Silver wattle ( <i>Acacia dealbata</i> ) forest	0	0	n/a	n/a
Thamnic rainforest on less fertile sites	335 000	307 000	91.6	25.1
<b>TOTAL</b>	<b>1 229 000</b>	<b>973 000</b>	<b>79.2</b>	<b>24.5</b>

(a) Forest extent is as at the first quarter of 2005 and reserve classes are as at 30 June 2006

## APPENDIX 1.2.a – FOREST DWELLING SPECIES

Table 1.2.a.1 Forest Dwelling Vertebrate Fauna

Class	Species	Common name	If sensitive are recovery or similar plans being implemented	Instrument being implemented.	widespread	Vulnerable	rare	endangered	presumed extinct
Fish	<i>Galaxias brevipinnis</i>	Climbing Galaxias			Y				
	<i>Galaxias johnstoni</i>	Clarence Galaxias	Y	Recovery plan				Y	
	<i>Galaxias maculatus</i>	Jollytail			Y				
	<i>Galaxias truttaceus</i>	Spotted Galaxias							
	<i>Galaxias auratus</i>	Golden Galaxias					Y		
	<i>Galaxias tanycephalus</i>	Saddled Galaxias	Y	Recovery plan				Y	
	<i>Galaxias fontanus</i>	Swan Galaxias	Y	Recovery plan				Y	
	<i>Paragalaxias mesotes</i>	Arthurs Paragalaxias							
	<i>Galaxiella pusilla</i>	Dwarf Galaxias			Recovery plan			Y	
	<i>Prototroctes maraena</i>	Australian Grayling							Y
	<i>Gadopsis marmoratus</i>	Blackfish				Y			
	Amphibians	<i>Litoria ewingi</i>	Brown Tree Frog			Y			
<i>Litoria burrowsi</i>		Tasmanian Tree Frog							
<i>Litoria raniformis</i>		Green and Golden frog	Y	Listing statement		Y			
<i>Crinia tasmaniensis</i>		Tasmanian Froglet			Y				
<i>Geocrinia laevis</i>		Tasmanian Smooth Frog			Y				
<i>Crinia signifera</i>		Brown Froglet			Y				
<i>Pseudophryne semimarmorata</i>		Southern Toadlet			Y				
<i>Limnodynastes peroni</i>		Perons Marsh Frog					Y		
<i>Limnodynastes tasmaniensis</i>	Spotted Grass Frog			Y					
Reptiles	<i>Lampropholis delicata</i>	Delicate Grass Skink			Y				
	<i>Pseudemoia entrecasteauxii</i>	Southern Grass Skink			Y				
	<i>Pseudemoia pagenstecheri</i>	Tussock Skink							
	<i>Pseudemoia rawlinsoni</i>	Glossy Grass Skink					Y		Y
	<i>Niveoscincus metallicus</i>	Metallic Skink			Y				
	<i>Niveoscincus ocellatus</i>	Ocellated Skink			Y				
	<i>Niveoscincus pretiosus</i>	Tasmanian Tree Skink			Y				
	<i>Bassiana duperryi</i>	Three-lined Skink			Y				
	<i>Egernia whitei</i>	White's Skink			Y				
	<i>Cyclodomorphus casuarinae</i>	She-oak Skink			Y				
	<i>Tiliqua nigrolutea</i>	Blotched Blue-tongue			Y				
	<i>Tympanocryptis diemensis</i>	Mountain Dragon			Y				
	<i>Austrelaps superbus</i>	Copperhead Snake			Y				
	<i>Notechis ater</i>	Tiger Snake			Y				

Class	Species	Common name	If sensitive are recovery or similar plans being implemented	Instrument being implemented.	widespread	Vulnerable	rare	endangered	presumed extinct
Reptiles (contd.)	<i>Drysdalia coronoides</i>	White-lipped Snake			Y				
<b>Birds</b>									
	<i>Accipiter fasciatus</i>	Brown Goshawk			Y				
	<i>Accipiter cirrhocephalus</i>	Collared Sparrowhawk			Y				
	<i>Accipiter novaehollandiae</i>	Grey Goshawk						Y	
	<i>Haliaeetus leucogaster</i>	White-bellied Sea Eagle	Y	Recovery plan				Y	
	<i>Aquila audax</i>	Wedge-tailed Eagle	Y	Recovery plan				Y	
	<i>Falco peregrinus</i>	Peregrine Falcon			Y				
	<i>Falco berigora</i>	Brown Falcon			Y				
	<i>Coturnix ypsilophorus</i>	Brown Quail			Y				
	<i>Turnix varia</i>	Painted Button-quail			Y				
	<i>Phaps chalcoptera</i>	Common Bronzewing			Y				
	<i>Phaps elegans</i>	Brush Bronzewing			Y				
	<i>Calyptorhynchus funereus</i>	Yellow-tailed Black Cockatoo			Y				
	<i>Cacatua galerita</i>	Sulphur-crested Cockatoo			Y				
	<i>Glossopsitta concinna</i>	Musk Lorikeet			Y				
	<i>Pezoporus wallicus</i>	Ground Parrot			Y				
	<i>Lathamus discolor</i>	Swift Parrot	Y	Recovery plan				Y	
	<i>Platycercus caledonicus</i>	Green Rosella			Y				
	<i>Platycercus caledonicus brownii</i>	King Island Green Rosella				Y			
	<i>Platycercus eximius</i>	Eastern Rosella			Y				
	<i>Neophema chrysostoma</i>	Blue-winged Parrot			Y				
	<i>Neophema chrysogaster</i>	Orange-bellied Parrot	Y	Recovery plan				Y	
	<i>Cuculus pallidus</i>	Pallid Cuckoo			Y				
	<i>Cacomantis flabelliformis</i>	Fan-tailed Cuckoo			Y				
	<i>Chrysococcyx basalis</i>	Horsefield's Bronze Cuckoo			Y				
	<i>Chrysococcyx lucidus</i>	Shining Bronze Cuckoo			Y				
	<i>Ninox novaeseelandiae</i>	Southern Boobook			Y				
	<i>Tyto novaehollandiae</i>	Masked Owl						Y	
	<i>Podargus strigoides</i>	Tawny Frogmouth			Y				
	<i>Aeagotheles cristatus</i>	Australian Owllet-nightjar			Y				
	<i>Alcedo azurea</i>	Azure Kingfisher						Y	
	<i>Hirundo nigricans</i>	Tree Martin			Y				
	<i>Anthus novaeseelandiae</i>	Richards Pipit			Y				
	<i>Coracina novaehollandiae</i>	Black Faced Cuckoo Shrike			Y				
	<i>Zoothera lunulata</i>	Bassian Thrush			Y				
	<i>Petroica rodinogaster</i>	Pink Robin			Y				
	<i>Petroica phoenicea</i>	Flame Robin			Y				
	<i>Petroica multicolor</i>	Scarlet Robin			Y				
	<i>Melanodryas vittata</i>	Dusky Robin			Y				
	<i>Pachycephala olivacea</i>	Olive Whistler			Y				
	<i>Pachycephala pectoralis</i>	Golden Whistler			Y				
	<i>Colluricincla harmonica</i>	Grey Shrike Thrush			Y				

Class	Species	Common name	If sensitive are recovery or similar plans being implemented	Instrument being implemented.	widespread	Vulnerable	rare	endangered	presumed extinct
Birds (cont)	<i>Myiagra cyanoleuca</i>	Satin Flycatcher			Y				
	<i>Rhipidura fuliginosa</i>	Grey Fantail			Y				
	<i>Cinclosoma punctatum</i>	Spotted Quail-thrush			Y				
	<i>Malurus cyaneus</i>	Superb Fairy-wren			Y				
	<i>Sericornis frontalis</i>	White-browed Scrubwren			Y				
	<i>Acanthornis magnus</i>	Scrubtit			Y				
	<i>Acanthornis magnus greenianus</i>	King Island Scrubtit						Y	
	<i>Acanthiza pusilla</i>	Brown Thornbill			Y				
	<i>Acanthiza pusilla archibaldi</i>	King Island thornbill						Y	
	<i>Acanthiza ewingii</i>	Tasmanian Thornbill			Y				
	<i>Anthochaera paradoxa</i>	Yellow Wattlebird			Y				
	<i>Anthochaera chrysoptera</i>	Little Wattlebird			Y				
	<i>Lichenostomus flavicollis</i>	Yellow-throated Honeyeater			Y				
	<i>Melithreptus validirostris</i>	Strong-billed Honeyeater			Y				
	<i>Melithreptus affinis</i>	Black-headed Honeyeater			Y				
	<i>Phylidonyris pyrrhoptera</i>	Crescent Honeyeater			Y				
	<i>Phylidonyris novaehollandiae</i>	New Holland Honeyeater			Y				
	<i>Acanthorhynchus tenuirostris</i>	Eastern Spinebill			Y				
	<i>Pardalotus punctatus</i>	Spotted Pardalote			Y				
	<i>Pardalotus quadragintus</i>	Forty-spotted Pardalote		Recovery Plan				Y	
	<i>Pardalotus striatus</i>	Striated Pardalote			Y				
	<i>Zosterops lateralis</i>	Silvereye			Y				
	<i>Stagonopleura bella</i>	Beautiful Firetail			Y				
	<i>Artamus cyanopterus</i>	Dusky Woodswallow			Y				
	<i>Cracticus torquatus</i>	Grey Butcherbird			Y				
	<i>Strepera fuliginosa</i>	Black Currawong			Y				
	<i>Strepera versicolor</i>	Grey Currawong			Y				
<i>Corvus tasmanicus</i>	Forest Raven			Y					
Mammals	<i>Tachyglossus aculeatus</i>	Echidna			Y				
	<i>Ornithorhynchus anatinus</i>	Platypus			Y				
	<i>Macropus giganteus</i>	Forester kangaroo			Y				
	<i>Macropus rufogriseus</i>	Bennett's Wallaby			Y				
	<i>Thylogale billardieri</i>	Tasmanian Pademelon			Y				
	<i>Bettongia gaimardi</i>	Tasmanian Bettong			Y				
	<i>Potorous tridactylus</i>	Long-nosed Potoroo			Y				
	<i>Trichosurus vulpecula</i>	Common Brush-tail Possum			Y				
	<i>Pseudocheirus peregrinus</i>	Common Ringtail Possum			Y				
	<i>Petaurus breviceps</i>	Sugar Glider			Y				
	<i>Cercartetus nanus</i>	Eastern Pygmy-possum			Y				
	<i>Cercartetus lepidus</i>	Little Pygmy-possum			Y				
	<i>Vombatus ursinus</i>	Common Wombat			Y				
	<i>Vombatus ursinus ursinus</i>	Common Wombat (Bass Strait)					Y		

Class	Species	Common name	If sensitive are recovery or similar plans being implemented	Instrument being implemented.	widespread	Vulnerable	rare	endangered	presumed extinct
(mammals cont.)	<i>Isoodon obesulus</i>	Southern Brown Bandicoot	Y	Recovery plan	Y	Y	Y		
	<i>Perameles gunnii</i>	Eastern Barred-bandicoot							
	<i>Dasyurus maculatus</i>	Spotted-tailed Quoll							
	<i>Dasyurus viverrinus</i>	Eastern Quoll							
	<i>Sarcophilus harrisii</i>	Tasmanian Devil							
	<i>Antechinus swainsonii</i>	Dusky Antechinus							
	<i>Antechinus minimus</i>	Swamp Antechinus							
	<i>Sminthopsis leucopus</i>	White-footed Dunnart							
	<i>Rattus lutreolus</i>	Swamp Rat							
	<i>Pseudomys higginsi</i>	Long-tailed Mouse							
	<i>Pseudomys novaehollandiae</i>	New Holland Mouse							
	<i>Vespadelus vulturnus</i>	Small Forest Vespadelus							
	<i>Vespadelus regulus</i>	King River Vespadelus							
	<i>Vespadelus darlingtoni</i>	Large Forest Vespadelus							
	<i>Nyctophilus geoffroyi</i>	Lesser Long-eared Bat							
	<i>Nyctophilus timoriensis sherrini</i>	Greater Long-eared Bat							
	<i>Chalinolobus morio</i>	Chocolate Wattled Bat							
	<i>Chalinolobus gouldii</i>	Gould's Wattled Bat							
	<i>Falsistrellus tasmaniensis</i>	Tasmanian Pipistrelle							

**Table 1.2.a.2 Forest dwelling plant species**

Family	Scientific name	Common name	RFA priority	TSPA status 2007	change	TSPA status 2002
<b>ORDER DICOTYLEDONAE</b>						
AMARANTHACEAE	<i>Alternanthera denticulata</i>	Lesser joyweed	Proposed RFA priority species	endangered	no change	endangered
APIACEAE	<i>Eryngium ovinum</i>	Blue devil	RFA priority species	vulnerable	no change	vulnerable
APIACEAE	<i>Hydrocotyle comocarpa</i>	Fringe-fruit pennywort	RFA priority species	rare	no change	rare
APIACEAE	<i>Hydrocotyle laxiflora</i>	Stinking pennywort	RFA priority species	vulnerable	no change	vulnerable
APIACEAE	<i>Daucus glochidiatus</i>	australian carrot	Not RFA priority species	not listed		
APIACEAE	<i>Hydrocotyle callicarpa</i>	tiny pennywort	Not RFA priority species	not listed		
APIACEAE	<i>Hydrocotyle hirta</i>	hairy pennywort	Not RFA priority species	not listed		
APIACEAE	<i>Hydrocotyle muscosa</i>	mossy pennywort	Not RFA priority species	not listed		
APIACEAE	<i>Hydrocotyle pterocarpa</i>	winged pennywort	Not RFA priority species	not listed		
APIACEAE	<i>Hydrocotyle sibthorpioides</i>	shining pennywort	Not RFA priority species	not listed		
APIACEAE	<i>Oreomyrrhis gunnii</i>	limestone caraway	Not RFA priority species	not listed		
APIACEAE	<i>Xanthosia pilosa</i>	woolly crossherb	Not RFA priority species	not listed		
APIACEAE	<i>Xanthosia ternifolia</i>	shrubby crossherb	Not RFA priority species	not listed		
ARALIACEAE	<i>Polyscias sambucifolia</i>	Elderberry panax	RFA priority species	vulnerable	no change	vulnerable
ARALIACEAE	<i>Pseudopanax gunnii</i>	forest fernbush	Not RFA priority species	not listed		
ASTERACEAE	<i>Millotia tenuifolia</i> var. <i>tenuifolia</i>	Soft millotia	Not RFA priority species	not listed	delisted	rare
ASTERACEAE	<i>Ozothamnus reflexifolius</i>	Reflexed everlasting	Proposed RFA priority species	vulnerable	new listing	not listed
ASTERACEAE	<i>Brachyscome perpusilla</i>	Tiny daisy	Proposed RFA priority species	rare	no change	rare
ASTERACEAE	<i>Chrysocephalum baxteri</i>	Fringed everlasting	Proposed RFA priority species	rare	no change	rare
ASTERACEAE	<i>Siloxerus multiflorus</i>	Small wrinklewort	Proposed RFA priority species	rare	no change	rare
ASTERACEAE	<i>Vittadinia cuneata</i> var. <i>cuneata</i>	Fuzzy New Holland daisy	Proposed RFA priority species	rare	no change	rare
ASTERACEAE	<i>Xerochrysum bicolor</i>	White alpine everlasting	Proposed RFA priority species	rare	no change	rare
ASTERACEAE	<i>Argentipallium spiceri</i>	Spicer's everlasting	RFA priority species	endangered	no change	endangered
ASTERACEAE	<i>Bedfordia arborescens</i>	Blanket leaf	RFA priority species	rare	no change	rare
ASTERACEAE	<i>Brachyglottis brunonis</i>	Brown's tree daisy	RFA priority species	rare	no change	rare
ASTERACEAE	<i>Brachyscome radicata</i>	Rooted daisy	RFA priority species	rare	no change	rare
ASTERACEAE	<i>Brachyscome rigidula</i>	Hairy cutleaf daisy	RFA priority species	vulnerable	no change	vulnerable
ASTERACEAE	<i>Brachyscome sieberi</i> var. <i>gunnii</i>	Sieber's daisy	RFA priority species	rare	no change	rare
ASTERACEAE	<i>Centipeda cunninghamii</i>	Common sneezeweed	RFA priority species	rare	no change	rare
ASTERACEAE	<i>Hyalosperma demissum</i>	Moss sunray	RFA priority species	endangered	no change	endangered
ASTERACEAE	<i>Isoetopsis graminifolia</i>	Grass cushions	RFA priority species	endangered	no change	endangered
ASTERACEAE	<i>Leucochrysum albicans</i> subsp. <i>albicans</i> var. <i>tricolor</i>	Grassland paper daisy	RFA priority species	endangered	no change	endangered
ASTERACEAE	<i>Odixia achlaena</i>	Odixia	RFA priority species	rare	no change	rare
ASTERACEAE	<i>Olearia hookeri</i>	Hooker's daisy bush	RFA priority species	rare	no change	rare
ASTERACEAE	<i>Ozothamnus lycopodioides</i>	Lycopoid everlasting	RFA priority species	rare	no change	rare
ASTERACEAE	<i>Senecio macrocarpus</i>	Fluffy groundsel	RFA priority species	extinct	no change	extinct
ASTERACEAE	<i>Senecio squarrosus</i>	Leafy groundsel	RFA priority species	rare	no change	rare

Family	Scientific name	Common name	RFA priority	TSPA status 2007	change	TSPA status 2002
ASTERACEAE	<i>Senecio velleioides</i>	Forest groundsel	RFA priority species	rare	no change	rare
ASTERACEAE	<i>Vittadinia gracilis</i>	Woolly New Holland daisy	RFA priority species	rare	no change	rare
ASTERACEAE	<i>Vittadinia megacephala</i>	Giant New Holland daisy	RFA priority species	extinct	no change	extinct
ASTERACEAE	<i>Vittadinia muelleri</i>	Narrow leaf New Holland daisy	RFA priority species	rare	no change	rare
ASTERACEAE	<i>Ozothamnus selaginoides</i>	Clubmoss everlasting	RFA priority species	extinct	uplisted	endangered
ASTERACEAE	<i>Allittia cardiocarpa</i>	swamp daisy	Not RFA priority species	not listed		
ASTERACEAE	<i>Argentipallium obtusifolium</i>	blunt everlasting	Not RFA priority species	not listed		
ASTERACEAE	<i>Bedfordia linearis</i> subsp. <i>linearis</i>	slender blanketleaf	Not RFA priority species	not listed		
ASTERACEAE	<i>Bedfordia linearis</i> subsp. <i>oblongifolia</i> var. <i>curvifolia</i>	curved blanketleaf	Not RFA priority species	not listed		
ASTERACEAE	<i>Bedfordia linearis</i> subsp. <i>oblongifolia</i> var. <i>oblongifolia</i>	blunt blanketleaf	Not RFA priority species	not listed		
ASTERACEAE	<i>Bedfordia salicina</i>	tasmanian blanketleaf	Not RFA priority species	not listed		
ASTERACEAE	<i>Cassinia trinerva</i>	veined dollybush	Not RFA priority species	not listed		
ASTERACEAE	<i>Centipeda elatinooides</i>	spreading sneezeweed	Not RFA priority species	not listed		
ASTERACEAE	<i>Chrysocephalum apiculatum</i>	common everlasting	Not RFA priority species	not listed		
ASTERACEAE	<i>Chrysocephalum semipapposum</i>	clustered everlasting	Not RFA priority species	not listed		
ASTERACEAE	<i>Cotula australis</i>	southern buttons	Not RFA priority species	not listed		
ASTERACEAE	<i>Craspedia coolaminica</i>	mountain billybuttons	Not RFA priority species	not listed		
ASTERACEAE	<i>Craspedia glauca</i>	common billybuttons	Not RFA priority species	not listed		
ASTERACEAE	<i>Cymbonotus preissianus</i>	southern bears-ears	Not RFA priority species	not listed		
ASTERACEAE	<i>Euchiton collinus</i>	common cottonleaf	Not RFA priority species	not listed		
ASTERACEAE	<i>Helichrysum scorpioides</i>	curling everlasting	Not RFA priority species	not listed		
ASTERACEAE	<i>Lagenophora gracilis</i>	slender bottledaisy	Not RFA priority species	not listed		
ASTERACEAE	<i>Lagenophora huegelii</i>	coarse bottledaisy	Not RFA priority species	not listed		
ASTERACEAE	<i>Lagenophora stipitata</i>	blue bottledaisy	Not RFA priority species	not listed		
ASTERACEAE	<i>Leptorhynchos nitidulus</i>	shiny buttons	Not RFA priority species	not listed		
ASTERACEAE	<i>Leptorhynchos squamatus</i> subsp. <i>squamatus</i>	scaly buttons	Not RFA priority species	not listed		
ASTERACEAE	<i>Leptorhynchos squamatus</i> subsp. <i>alpinus</i>	alpine scaly buttons	Not RFA priority species	not listed		
ASTERACEAE	<i>Microseris lanceolata</i>	yam daisy	Not RFA priority species	not listed		
ASTERACEAE	<i>Odixia angusta</i>	roundhead everlastingbush	Not RFA priority species	not listed		
ASTERACEAE	<i>Olearia algida</i>	alpine daisybush	Not RFA priority species	not listed		
ASTERACEAE	<i>Olearia archeri</i>	lanceleaf daisybush	Not RFA priority species	not listed		
ASTERACEAE	<i>Olearia argophylla</i>	musk daisybush	Not RFA priority species	not listed		
ASTERACEAE	<i>Olearia axillaris</i>	coast daisybush	Not RFA priority species	not listed		
ASTERACEAE	<i>Olearia ciliata</i>	fringed daisybush	Not RFA priority species	not listed		
ASTERACEAE	<i>Olearia ericoides</i>	heathy daisybush	Not RFA priority species	not listed		
ASTERACEAE	<i>Olearia erubescens</i>	moth daisybush	Not RFA priority species	not listed		

Family	Scientific name	Common name	RFA priority	TSPA status 2007	change	TSPA status 2002
ASTERACEAE	<i>Olearia floribunda</i>	flowery daisybush	Not RFA priority species	not listed		
ASTERACEAE	<i>Olearia glandulosa</i>	swamp daisybush	Not RFA priority species	not listed		
ASTERACEAE	<i>Olearia glutinosa</i>	sticky daisybush	Not RFA priority species	not listed		
ASTERACEAE	<i>Olearia lirata</i>	forest daisybush	Not RFA priority species	not listed		
ASTERACEAE	<i>Olearia myrsinoides</i>	silky daisybush	Not RFA priority species	not listed		
ASTERACEAE	<i>Olearia obcordata</i>	heartleaf daisybush	Not RFA priority species	not listed		
ASTERACEAE	<i>Olearia persoonioides</i>	geebung daisybush	Not RFA priority species	not listed		
ASTERACEAE	<i>Olearia phlogopappa</i> var. <i>angustifolia</i>	narrowleaf dusty daisybush	Not RFA priority species	not listed		
ASTERACEAE	<i>Olearia phlogopappa</i> var. <i>brevipes</i>	shy dusty daisybush	Not RFA priority species	not listed		
ASTERACEAE	<i>Olearia phlogopappa</i> var. <i>microcephala</i>	smallflower dusty daisybush	Not RFA priority species	not listed		
ASTERACEAE	<i>Olearia phlogopappa</i> var. <i>phlogopappa</i>	common dusty daisybush	Not RFA priority species	not listed		
ASTERACEAE	<i>Olearia phlogopappa</i> var. <i>salicifolia</i>	willowleaf dusty daisybush	Not RFA priority species	not listed		
ASTERACEAE	<i>Olearia phlogopappa</i> var. <i>subrepanda</i>	mountain dusty daisybush	Not RFA priority species	not listed		
ASTERACEAE	<i>Olearia pinifolia</i>	prickly daisybush	Not RFA priority species	not listed		
ASTERACEAE	<i>Olearia ramulosa</i>	twiggy daisybush	Not RFA priority species	not listed		
ASTERACEAE	<i>Olearia stellulata</i>	sawleaf daisybush	Not RFA priority species	not listed		
ASTERACEAE	<i>Olearia tasmanica</i>	tasmanian daisybush	Not RFA priority species	not listed		
ASTERACEAE	<i>Olearia viscosa</i>	viscid daisybush	Not RFA priority species	not listed		
ASTERACEAE	<i>Ozothamnus antennaria</i>	sticky everlastingbush	Not RFA priority species	not listed		
ASTERACEAE	<i>Ozothamnus costatifructus</i>	eastcoast everlastingbush	Not RFA priority species	not listed		
ASTERACEAE	<i>Ozothamnus hookeri</i>	scaly everlastingbush	Not RFA priority species	not listed		
ASTERACEAE	<i>Ozothamnus obcordatus</i>	yellow everlastingbush	Not RFA priority species	not listed		
ASTERACEAE	<i>Ozothamnus purpurascens</i>	columnar everlastingbush	Not RFA priority species	not listed		
ASTERACEAE	<i>Ozothamnus reticulatus</i>	veined everlastingbush	Not RFA priority species	not listed		
ASTERACEAE	<i>Ozothamnus rosmarinifolius</i>	swamp everlastingbush	Not RFA priority species	not listed		
ASTERACEAE	<i>Ozothamnus scutellifolius</i>	buttonleaf everlastingbush	Not RFA priority species	not listed		
ASTERACEAE	<i>Ozothamnus thyrsoides</i>	arching everlastingbush	Not RFA priority species	not listed		
ASTERACEAE	<i>Picris angustifolia</i> subsp. <i>angustifolia</i>	lowland hawkweed	Not RFA priority species	not listed		
ASTERACEAE	<i>Picris angustifolia</i> subsp. <i>merxmulleri</i>	mountain hawkweed	Not RFA priority species	not listed		
ASTERACEAE	<i>Podolepis jaceoides</i>	showy copperwire-daisy	Not RFA priority species	not listed		
ASTERACEAE	<i>Pseudognaphalium luteoalbum</i>	jersey cudweed	Not RFA priority species	not listed		
ASTERACEAE	<i>Senecio biserratus</i>	jagged fireweed	Not RFA priority species	not listed		
ASTERACEAE	<i>Senecio extensus</i>	subalpine fireweed	Not RFA priority species	not listed		
ASTERACEAE	<i>Senecio glomeratus</i> subsp. <i>glomeratus</i>	shortfruit purple fireweed	Not RFA priority species	not listed		

Family	Scientific name	Common name	RFA priority	TSPA status 2007	change	TSPA status 2002
ASTERACEAE	<i>Senecio glomeratus</i> subsp. <i>longifructus</i>	longfruit purple fireweed	Not RFA priority species	not listed		
ASTERACEAE	<i>Senecio hispidissimus</i>	coarse fireweed	Not RFA priority species	not listed		
ASTERACEAE	<i>Senecio hispidulus</i>	rough fireweed	Not RFA priority species	not listed		
ASTERACEAE	<i>Senecio linearifolius</i> var. <i>arachnoideus</i>	cobweb fireweed groundsel	Not RFA priority species	not listed		
ASTERACEAE	<i>Senecio linearifolius</i> var. <i>denticulatus</i>	toothed fireweed groundsel	Not RFA priority species	not listed		
ASTERACEAE	<i>Senecio linearifolius</i> var. <i>linearifolius</i>	common fireweed groundsel	Not RFA priority species	not listed		
ASTERACEAE	<i>Senecio microbasis</i>	narrow fireweed	Not RFA priority species	not listed		
ASTERACEAE	<i>Senecio minimus</i>	shrubby fireweed	Not RFA priority species	not listed		
ASTERACEAE	<i>Senecio phelleus</i>	rock fireweed	Not RFA priority species	not listed		
ASTERACEAE	<i>Senecio pinnatifolius</i> var. <i>alpinus</i>	highland groundsel	Not RFA priority species	not listed		
ASTERACEAE	<i>Senecio pinnatifolius</i> var. <i>lanceolatus</i>	lanceleaf coast groundsel	Not RFA priority species	not listed		
ASTERACEAE	<i>Senecio prenanthoides</i>	common fireweed	Not RFA priority species	not listed		
ASTERACEAE	<i>Senecio quadridentatus</i>	cotton fireweed	Not RFA priority species	not listed		
ASTERACEAE	<i>Senecio vagus</i>	sawleaf groundsel	Not RFA priority species	not listed		
ASTERACEAE	<i>Senecio Xorarius</i>	coast groundsel	Not RFA priority species	not listed		
ASTERACEAE	<i>Solenogyne dominii</i>	smooth flat-herb	Not RFA priority species	not listed		
ASTERACEAE	<i>Solenogyne gunnii</i>	hairy flat-herb	Not RFA priority species	not listed		
ASTERACEAE	<i>Taraxacum cygnorum</i>	coast dandelion	Proposed RFA priority species	not listed		
ASTERACEAE	<i>Vittadinia burbridgeae</i>	smooth new-holland-daisy	Proposed RFA priority species	not listed		
ASTERACEAE	<i>Xerochrysum palustre</i>	swamp everlasting	Proposed RFA priority species	not listed		
BIGNONIACEAE	<i>Pandorea pandorana</i>	Wonga vine	RFA priority species	rare	no change	rare
BORAGINACEAE	<i>Austrocynoglossum latifolium</i>	Forest hound's tongue	Proposed RFA priority species	rare	no change	rare
BORAGINACEAE	<i>Cynoglossum suaveolens</i>	sweet houndstongue	Not RFA priority species	not listed		
BORAGINACEAE	<i>Myosotis australis</i>	southern forgetmenot	Not RFA priority species	not listed		
BORAGINACEAE	<i>Myosotis exarrhena</i>	sweet forgetmenot	Not RFA priority species	not listed		
BRASSICACEAE	<i>Stenopetalum lineare</i>	Threadcross	Proposed RFA priority species	endangered	no change	endangered
BRASSICACEAE	<i>Ballantinia antipoda</i>	Southern ballantine	RFA priority species	extinct	no change	extinct
BRASSICACEAE	<i>Barbarea australis</i>	Native wintercress	RFA priority species	endangered	no change	endangered
BRASSICACEAE	<i>Lepidium hyssopifolium</i>	Basalt peppergrass	RFA priority species	endangered	no change	endangered
BRASSICACEAE	<i>Lepidium pseudotasmanicum</i>	Shade peppergrass	RFA priority species	rare	no change	rare
BRASSICACEAE	<i>Rorippa dictyosperma</i>	forest bittercress	Not RFA priority species	not listed		
BRUNONIACEAE	<i>Brunonia australis</i>	Blue pincushion	RFA priority species	vulnerable	no change	vulnerable
CAMPANULACEAE	<i>Lobelia pratioides</i>	Poison lobelia	RFA priority species	vulnerable	no change	vulnerable
CAMPANULACEAE	<i>Lobelia rhombifolia</i>	Branched lobelia	RFA priority species	rare	no change	rare
CAMPANULACEAE	<i>Isotoma fluviatilis</i> subsp. <i>australis</i>	swamp stars	Not RFA priority species	not listed		
CAMPANULACEAE	<i>Lobelia anceps</i>	angled lobelia	Not RFA priority species	not listed		

Family	Scientific name	Common name	RFA priority	TSPA status 2007	change	TSPA status 2002
CAMPANULACEAE	<i>Lobelia gibbosa</i> var. <i>browniana</i>	toothed lobelia	Not RFA priority species	not listed		
CAMPANULACEAE	<i>Wahlenbergia gracilentia</i>	annual bluebell	Not RFA priority species	not listed		
CAMPANULACEAE	<i>Wahlenbergia gymnoclada</i>	naked bluebell	Not RFA priority species	not listed		
CAMPANULACEAE	<i>Wahlenbergia multicaulis</i>	bushy bluebell	Not RFA priority species	not listed		
CAPRIFOLIACEAE	<i>Sambucus gaudichaudiana</i>	white elderberry	Not RFA priority species	not listed		
CARYOPHYLLACEAE	<i>Scleranthus brockiei</i>	Brock knawel	Proposed RFA priority species	rare	no change	rare
CARYOPHYLLACEAE	<i>Colobanthus curtisiae</i>	Curtis' colobanth	RFA priority species	rare	no change	rare
CARYOPHYLLACEAE	<i>Scleranthus diander</i>	Tufted knawel	RFA priority species	vulnerable	no change	vulnerable
CARYOPHYLLACEAE	<i>Scleranthus fasciculatus</i>	Spreading knawel	RFA priority species	vulnerable	no change	vulnerable
CARYOPHYLLACEAE	<i>Stellaria multiflora</i>	Rayless starwort	RFA priority species	rare	no change	rare
CARYOPHYLLACEAE	<i>Colobanthus affinis</i>	alpine cupflower	Not RFA priority species	not listed		
CARYOPHYLLACEAE	<i>Scleranthus biflorus</i>	twinflower knawel	Not RFA priority species	not listed		
CARYOPHYLLACEAE	<i>Stellaria flaccida</i>	forest starwort	Not RFA priority species	not listed		
CARYOPHYLLACEAE	<i>Stellaria pungens</i>	prickly starwort	Not RFA priority species	not listed		
CASUARINACEAE	<i>Allocasuarina crassa</i>	Capes she-oak	RFA priority species	rare	no change	rare
CASUARINACEAE	<i>Allocasuarina duncanii</i>	Duncan's she-oak	RFA priority species	rare	no change	rare
CASUARINACEAE	<i>Allocasuarina littoralis</i>	black sheoak	Not RFA priority species	not listed		
CASUARINACEAE	<i>Allocasuarina monilifera</i>	necklace sheoak	Not RFA priority species	not listed		
CASUARINACEAE	<i>Allocasuarina verticillata</i>	drooping sheoak	Not RFA priority species	not listed		
CLUSIACEAE	<i>Hypericum gramineum</i>	small st johns-wort	Not RFA priority species	not listed		
CLUSIACEAE	<i>Hypericum japonicum</i>	matted st johns-wort	Not RFA priority species	not listed		
CONVOLVULACEAE	<i>Calystegia sepium</i>	Great bindweed	Proposed RFA priority species	rare	downlisted	extinct
CONVOLVULACEAE	<i>Calystegia marginata</i>	Forest bindweed	Proposed RFA priority species	not listed		
CONVOLVULACEAE	<i>Convolvulus angustissimus</i> var. <i>angustissimus</i>	blushing bindweed	Not RFA priority species	not listed		
CONVOLVULACEAE	<i>Dichondra repens</i>	kidneyweed	Not RFA priority species	not listed		
CRASSULACEAE	<i>Crassula sieberiana</i> subsp. <i>sieberiana</i>	rock stonecrop	Not RFA priority species	not listed		
CRASSULACEAE	<i>Crassula sieberiana</i> subsp. <i>tetramera</i>	wiry stonecrop	Not RFA priority species	not listed		
CUNONIACEAE	<i>Anodopetalum biglandulosum</i>	horizontal	Not RFA priority species	not listed		
CUNONIACEAE	<i>Bauera rubioides</i>	wiry bauera	Not RFA priority species	not listed		
DILLENIACEAE	<i>Hibbertia</i> sp. 'Pontville'	Basalt guineaflower	Proposed RFA priority species	rare	new listing	not listed
DILLENIACEAE	<i>Hibbertia calycina</i>	Lesser guinea flower	RFA priority species	vulnerable	no change	vulnerable
DILLENIACEAE	<i>Hibbertia virgata</i>	Twiggy guinea flower	RFA priority species	rare	no change	rare
DILLENIACEAE	<i>Hibbertia empetrifolia</i> subsp. <i>empetrifolia</i>	scrambling guineaflower	Not RFA priority species	not listed		
DILLENIACEAE	<i>Hibbertia hirsuta</i>	hairy guineaflower	Not RFA priority species	not listed		
DILLENIACEAE	<i>Hibbertia hirticalyx</i>	bassian guineaflower	Not RFA priority species	not listed		
DILLENIACEAE	<i>Hibbertia procumbens</i>	spreading guineaflower	Not RFA priority species	not listed		
DILLENIACEAE	<i>Hibbertia riparia</i>	erect guineaflower	Not RFA priority species	not listed		

Family	Scientific name	Common name	RFA priority	TSPA status 2007	change	TSPA status 2002
DILLENIACEAE	<i>Hibbertia sericea</i> var. <i>sericea</i>	silky guineaflower	Not RFA priority species	not listed		
DILLENIACEAE	<i>Hibbertia serpyllifolia</i>	thyme guineaflower	Not RFA priority species	not listed		
DROSERACEAE	<i>Drosera peltata</i> subsp. <i>peltata</i>	pale sundew	Not RFA priority species	not listed		
ELAEOCARPACEAE	<i>Elaeocarpus reticulatus</i>	Blueberry ash	RFA priority species	rare	no change	rare
ELAEOCARPACEAE	<i>Aristotelia peduncularis</i>	heartberry	Not RFA priority species	not listed		
EPACRIDACEAE	<i>Epacris virgata</i> 'graniticola'	Mt Cameron heath	Proposed RFA priority species	vulnerable	new listing	not listed
EPACRIDACEAE	<i>Leucopogon lanceolatus</i> var. <i>lanceolatus</i>	Lance beard heath	Proposed RFA priority species	rare	no change	rare
EPACRIDACEAE	<i>Planocarpa nitida</i>	Shiny cheeseberry	Proposed RFA priority species	rare	no change	rare
EPACRIDACEAE	<i>Brachyloma depressum</i>	Spreading brachyloma	RFA priority species	rare	no change	rare
EPACRIDACEAE	<i>Epacris acuminata</i>	Clasping-leaf heath	RFA priority species	rare	no change	rare
EPACRIDACEAE	<i>Epacris apslayensis</i>	Apsley heath	RFA priority species	endangered	no change	endangered
EPACRIDACEAE	<i>Epacris barbata</i>	Bearded heath	RFA priority species	endangered	no change	endangered
EPACRIDACEAE	<i>Epacris curtisiae</i>	Curtis' heath	RFA priority species	rare	no change	rare
EPACRIDACEAE	<i>Epacris exserta</i>	South Esk heath	RFA priority species	vulnerable	no change	vulnerable
EPACRIDACEAE	<i>Epacris glabella</i>	Funnel heath	RFA priority species	endangered	no change	endangered
EPACRIDACEAE	<i>Epacris grandis</i>	Great heath	RFA priority species	vulnerable	no change	vulnerable
EPACRIDACEAE	<i>Epacris limbata</i>	Border heath	RFA priority species	endangered	no change	endangered
EPACRIDACEAE	<i>Epacris virgata</i>	Pretty heath	RFA priority species	vulnerable	no change	vulnerable
EPACRIDACEAE	<i>Leucopogon virgatus</i> var. <i>brevifolius</i>	Shortleaf beard heath	RFA priority species	rare	no change	rare
EPACRIDACEAE	<i>Monotoca submutica</i> var. <i>autumnalis</i>	Roundleaf broom heath	RFA priority species	rare	no change	rare
EPACRIDACEAE	<i>Pentachondra ericifolia</i>	Matted carpet heath	RFA priority species	rare	no change	rare
EPACRIDACEAE	<i>Acrotriche serrulata</i>	ants delight	Not RFA priority species	not listed		
EPACRIDACEAE	<i>Archeria eriocarpa</i>	hairy rainforest-heath	Not RFA priority species	not listed		
EPACRIDACEAE	<i>Archeria hirtella</i>	smooth rainforest-heath	Not RFA priority species	not listed		
EPACRIDACEAE	<i>Astroloma humifusum</i>	native cranberry	Not RFA priority species	not listed		
EPACRIDACEAE	<i>Astroloma pinifolium</i>	pine heath	Not RFA priority species	not listed		
EPACRIDACEAE	<i>Brachyloma ciliatum</i>	fringed heath	Not RFA priority species	not listed		
EPACRIDACEAE	<i>Cyathodes glauca</i>	purple cheeseberry	Not RFA priority species	not listed		
EPACRIDACEAE	<i>Dracophyllum milliganii</i>	curly mountainheath	Not RFA priority species	not listed		
EPACRIDACEAE	<i>Epacris exserta</i> (narrow sense)	South Esk heath	Proposed RFA priority species	not listed		
EPACRIDACEAE	<i>Epacris franklinii</i>	western riverheath	Proposed RFA priority species	not listed		
EPACRIDACEAE	<i>Epacris gunnii</i>	coral heath	Not RFA priority species	not listed		
EPACRIDACEAE	<i>Epacris heteronema</i>	southwest heath	Not RFA priority species	not listed		
EPACRIDACEAE	<i>Epacris impressa</i>	common heath	Not RFA priority species	not listed		
EPACRIDACEAE	<i>Epacris lanuginosa</i>	swamp heath	Not RFA priority species	not listed		
EPACRIDACEAE	<i>Epacris marginata</i>	rigid heath	RFA priority species	not listed		
EPACRIDACEAE	<i>Epacris mucronulata</i>	southern riverheath	RFA priority species	not listed		
EPACRIDACEAE	<i>Epacris obtusifolia</i>	bluntleaf heath	Not RFA priority species	not listed		

Family	Scientific name	Common name	RFA priority	TSPA status 2007	change	TSPA status 2002
EPACRIDACEAE	<i>Epacris</i> sp. Puzzler Gorge	Puzzler Gorge heath	Proposed RFA priority species	not listed		
EPACRIDACEAE	<i>Epacris tasmanica</i>	eastern heath	Not RFA priority species	not listed		
EPACRIDACEAE	<i>Epacris virgata</i> (Kettering)	Pretty heath	RFA priority species	not listed		
EPACRIDACEAE	<i>Epacris virgata</i> (Beaconsfield)	Pretty heath	RFA priority species	not listed		
EPACRIDACEAE	<i>Leptecophylla divaricata</i>	spreading pinkberry	Not RFA priority species	not listed		
EPACRIDACEAE	<i>Leptecophylla juniperina</i> subsp. <i>juniperina</i>	common pinkberry	Not RFA priority species	not listed		
EPACRIDACEAE	<i>Leptecophylla juniperina</i> subsp. <i>parvifolia</i>	mountain pinkberry	Not RFA priority species	not listed		
EPACRIDACEAE	<i>Leptecophylla juniperina</i> subsp. <i>oxycedrus</i>	coastal pinkberry	Not RFA priority species	not listed		
EPACRIDACEAE	<i>Leptecophylla pendulosa</i>	drooping pinkberry	Not RFA priority species	not listed		
EPACRIDACEAE	<i>Cyathodes platystoma</i>	tall cheeseberry	Not RFA priority species	not listed		
EPACRIDACEAE	<i>Leptecophylla pogonocalyx</i>	bearded pinkberry	Not RFA priority species	not listed		
EPACRIDACEAE	<i>Leucopogon australis</i>	spike beardheath	Not RFA priority species	not listed		
EPACRIDACEAE	<i>Leucopogon collinus</i>	white beardheath	Not RFA priority species	not listed		
EPACRIDACEAE	<i>Leucopogon ericoides</i>	pink beardheath	Not RFA priority species	not listed		
EPACRIDACEAE	<i>Leucopogon parviflorus</i>	coast beardheath	Not RFA priority species	not listed		
EPACRIDACEAE	<i>Leucopogon stuartii</i>	prickly beardheath	Not RFA priority species	not listed		
EPACRIDACEAE	<i>Leucopogon virgatus</i> var. <i>virgatus</i>	twiggy beardheath	Not RFA priority species	not listed		
EPACRIDACEAE	<i>Lissanthe strigosa</i> subsp. <i>subulata</i>	peachberry heath	Not RFA priority species	not listed		
EPACRIDACEAE	<i>Monotoca elliptica</i>	tree broomheath	Not RFA priority species	not listed		
EPACRIDACEAE	<i>Monotoca glauca</i>	goldey wood	Not RFA priority species	not listed		
EPACRIDACEAE	<i>Monotoca linifolia</i> subsp. <i>algida</i>	alpine nodding broomheath	Not RFA priority species	not listed		
EPACRIDACEAE	<i>Monotoca linifolia</i> subsp. <i>linifolia</i>	nodding broomheath	Not RFA priority species	not listed		
EPACRIDACEAE	<i>Monotoca scoparia</i>	prickly broomheath	Not RFA priority species	not listed		
EPACRIDACEAE	<i>Monotoca submutica</i> var. <i>submutica</i>	mountain broomheath	Not RFA priority species	not listed		
EPACRIDACEAE	<i>Pentachondra involucreta</i>	forest frillyheath	Not RFA priority species	not listed		
EPACRIDACEAE	<i>Prionotes cerinthoides</i>	climbing heath	Not RFA priority species	not listed		
EPACRIDACEAE	<i>Richea dracophylla</i>	pineapple candleheath	Not RFA priority species	not listed		
EPACRIDACEAE	<i>Richea gunnii</i>	bog candleheath	Not RFA priority species	not listed		
EPACRIDACEAE	<i>Richea milliganii</i>	nodding candleheath	Not RFA priority species	not listed		
EPACRIDACEAE	<i>Richea pandanifolia</i> subsp. <i>pandanifolia</i>	pandani	Not RFA priority species	not listed		
EPACRIDACEAE	<i>Richea pandanifolia</i> subsp. <i>ramulosa</i>	branching pandani	Not RFA priority species	not listed		
EPACRIDACEAE	<i>Richea procera</i>	lax candleheath	Not RFA priority species	not listed		
EPACRIDACEAE	<i>Richea scoparia</i>	scoparia	Not RFA priority species	not listed		
EPACRIDACEAE	<i>Richea Xcurtisiae</i>	hybrid candleheath	Not RFA priority species	not listed		
EPACRIDACEAE	<i>Sprengelia incarnata</i>	pink swampheath	Not RFA priority species	not listed		
EPACRIDACEAE	<i>Styphelia adscendens</i>	golden heath	Not RFA priority species	not listed		

Family	Scientific name	Common name	RFA priority	TSPA status 2007	change	TSPA status 2002
EPACRIDACEAE	<i>Trochocarpa cunninghamii</i>	stragglng purpleberry	Not RFA priority species	not listed		
EPACRIDACEAE	<i>Trochocarpa disticha</i>	spreading purpleberry	Not RFA priority species	not listed		
EPACRIDACEAE	<i>Trochocarpa gunnii</i>	fragrant purpleberry	Not RFA priority species	not listed		
ERICACEAE	<i>Gaultheria depressa</i>	creeping waxberry	Not RFA priority species	not listed		
ERICACEAE	<i>Gaultheria hispida</i>	copperleaf snowberry	Not RFA priority species	not listed		
ESCALLONIACEAE	<i>Anopterus glandulosus</i>	Tasmanian laurel	Not RFA priority species	not listed		
ESCALLONIACEAE	<i>Tetracarpaea tasmanica</i>	delicate laurel	Not RFA priority species	not listed		
EUCRYPHIACEAE	<i>Eucryphia lucida</i>	leatherwood	Not RFA priority species	not listed		
EUCRYPHIACEAE	<i>Eucryphia milliganii</i> subsp. <i>milliganii</i>	dwarf leatherwood	Not RFA priority species	not listed		
EUCRYPHIACEAE	<i>Eucryphia milliganii</i> subsp. <i>pubescens</i>	hairy dwarf leatherwood	Not RFA priority species	not listed		
EUPHORBIACEAE	<i>Bertya tasmanica</i> subsp. <i>tasmanica</i>	Tasmanian bertya	Proposed RFA priority species	vulnerable	no change	vulnerable
EUPHORBIACEAE	<i>Micrantheum serpentinum</i>	Serpentine micrantheum	RFA priority species	vulnerable	no change	vulnerable
EUPHORBIACEAE	<i>Amperea xiphoclada</i>	broom spurge	Not RFA priority species	not listed		
EUPHORBIACEAE	<i>Beyeria viscosa</i>	pinkwood	Not RFA priority species	not listed		
EUPHORBIACEAE	<i>Micrantheum hexandrum</i>	river tridentbush	Not RFA priority species	not listed		
EUPHORBIACEAE	<i>Poranthera microphylla</i>	small poranthera	Not RFA priority species	not listed		
EUPHORBIACEAE	<i>Ricinocarpos pinifolius</i>	wedding bush	Not RFA priority species	not listed		
FABACEAE	<i>Hovea tasmanica</i>	Hill hovea	Proposed RFA priority species	rare	new listing	not listed
FABACEAE	<i>Hovea montana</i>	Mountain hovea	Proposed RFA priority species	rare	no change	rare
FABACEAE	<i>Pultenaea mollis</i>	Guinea flower bush pea	Proposed RFA priority species	vulnerable	no change	vulnerable
FABACEAE	<i>Stonesiella selaginoides</i>	Clubmoss bush pea	Proposed RFA priority species	vulnerable	no change	vulnerable
FABACEAE	<i>Bossiaea obcordata</i>	spiny bossiaea	RFA priority species	rare	no change	rare
FABACEAE	<i>Desmodium gunnii</i>	slender tick trefoil	RFA priority species	vulnerable	no change	vulnerable
FABACEAE	<i>Glycine latrobeana</i>	Clover glycine	RFA priority species	vulnerable	no change	vulnerable
FABACEAE	<i>Glycine microphylla</i>	Small-leaf glycine	RFA priority species	vulnerable	no change	vulnerable
FABACEAE	<i>Gompholobium ecostatium</i>	dwarf wedge pea	RFA priority species	endangered	no change	endangered
FABACEAE	<i>Hardenbergia violacea</i>	purple coral pea	RFA priority species	endangered	no change	endangered
FABACEAE	<i>Hovea corrickiae</i>	Glossy hovea	RFA priority species	rare	no change	rare
FABACEAE	<i>Pultenaea humilis</i>	Dwarf bush pea	RFA priority species	vulnerable	no change	vulnerable
FABACEAE	<i>Pultenaea prostrata</i>	Prostrate bush pea	RFA priority species	vulnerable	no change	vulnerable
FABACEAE	<i>Viminaria juncea</i>	Golden spray	RFA priority species	endangered	no change	endangered
FABACEAE	<i>Mirbelia oxylobioides</i>	Mountain mirbelia	RFA priority species	vulnerable	uplisted	rare
FABACEAE	<i>Almaleea subumbellata</i>	wiry bushpea	Not RFA priority species	not listed		
FABACEAE	<i>Aotus ericoides</i>	golden pea	Not RFA priority species	not listed		
FABACEAE	<i>Bossiaea cinerea</i>	showy bossia	Not RFA priority species	not listed		
FABACEAE	<i>Bossiaea cordigera</i>	wiry bossia	Not RFA priority species	not listed		
FABACEAE	<i>Bossiaea prostrata</i>	creeping bossia	Not RFA priority species	not listed		
FABACEAE	<i>Bossiaea riparia</i>	leafless bossia	Not RFA priority species	not listed		

Family	Scientific name	Common name	RFA priority	TSPA status 2007	change	TSPA status 2002
FABACEAE	<i>Daviesia latifolia</i>	hop bitterpea	Not RFA priority species	not listed		
FABACEAE	<i>Daviesia sejugata</i>	leafy spiky bitterpea	Not RFA priority species	not listed		
FABACEAE	<i>Daviesia ulicifolia</i> subsp. <i>ulicifolia</i>	yellow spiky bitterpea	Not RFA priority species	not listed		
FABACEAE	<i>Daviesia ulicifolia</i> subsp. <i>ruscifolia</i>	orange spiky bitterpea	Not RFA priority species	not listed		
FABACEAE	<i>Desmodium varians</i>	slender ticktrefoil	Proposed RFA priority species	not listed		
FABACEAE	<i>Dillwynia cinerascens</i>	grey parrotpea	Not RFA priority species	not listed		
FABACEAE	<i>Dillwynia glaberrima</i>	smooth parrotpea	Not RFA priority species	not listed		
FABACEAE	<i>Dillwynia sericea</i>	showy parrotpea	Not RFA priority species	not listed		
FABACEAE	<i>Glycine clandestina</i>	twining glycine	Not RFA priority species	not listed		
FABACEAE	<i>Gompholobium huegelii</i>	common wedgepea	Not RFA priority species	not listed		
FABACEAE	<i>Goodia lotifolia</i> var. <i>lotifolia</i>	smooth goldentip	Not RFA priority species	not listed		
FABACEAE	<i>Goodia lotifolia</i> var. <i>pubescens</i>	silky goldentip	Not RFA priority species	not listed		
FABACEAE	<i>Hovea heterophylla</i>	winter purplepea	Not RFA priority species	not listed		
FABACEAE	<i>Hovea magnibractea</i>	sheath purplepea	Not RFA priority species	not listed		
FABACEAE	<i>Indigofera australis</i>	native indigo	Not RFA priority species	not listed		
FABACEAE	<i>Kennedia prostrata</i>	running postman	Not RFA priority species	not listed		
FABACEAE	<i>Oxylobium arborescens</i>	tall shaggypea	Not RFA priority species	not listed		
FABACEAE	<i>Oxylobium ellipticum</i>	golden shaggypea	Not RFA priority species	not listed		
FABACEAE	<i>Platylobium formosum</i>	handsome flatpea	Not RFA priority species	not listed		
FABACEAE	<i>Platylobium obtusangulum</i>	common flatpea	Not RFA priority species	not listed		
FABACEAE	<i>Platylobium triangulare</i>	arrow flatpea	Not RFA priority species	not listed		
FABACEAE	<i>Pultenaea daphnoides</i> var. <i>obcordata</i>	heartleaf bushpea	Not RFA priority species	not listed		
FABACEAE	<i>Pultenaea dentata</i>	swamp bushpea	Not RFA priority species	not listed		
FABACEAE	<i>Pultenaea fasciculata</i>	alpine bushpea	Not RFA priority species	not listed		
FABACEAE	<i>Pultenaea gunnii</i> var. <i>baeckeoides</i>	delicate golden bushpea	Not RFA priority species	not listed		
FABACEAE	<i>Pultenaea gunnii</i> var. <i>gunnii</i>	golden bushpea	Not RFA priority species	not listed		
FABACEAE	<i>Pultenaea juniperina</i>	prickly beauty	Not RFA priority species	not listed		
FABACEAE	<i>Pultenaea pedunculata</i>	matted bushpea	Not RFA priority species	not listed		
FABACEAE	<i>Pultenaea stricta</i>	rigid bushpea	Not RFA priority species	not listed		
FABACEAE	<i>Sphaerolobium minus</i>	eastern globepea	Not RFA priority species	not listed		
FAGACEAE	<i>Nothofagus cunninghamii</i>	myrtle beech	Not RFA priority species	not listed		
FAGACEAE	<i>Nothofagus gunnii</i>	deciduous beech	Not RFA priority species	not listed		
GENTIANACEAE	<i>Centaurium spicatum</i>	Australian centaurium	RFA priority species	rare	no change	rare
GERANIACEAE	<i>Geranium potentilloides</i>	mountain cranesbill	Not RFA priority species	not listed		
GERANIACEAE	<i>Geranium retrorsum</i>	grassland cranesbill	Not RFA priority species	not listed		
GERANIACEAE	<i>Geranium solanderi</i>	southern cranesbill	Not RFA priority species	not listed		
GOODENIACEAE	<i>Coopernookia barbata</i>	Purple goodenia	Proposed RFA priority species	extinct	no change	extinct
GOODENIACEAE	<i>Goodenia geniculata</i>	Bent goodenia	Proposed RFA priority species	rare	no change	rare
GOODENIACEAE	<i>Scaevola aemula</i>	Fairy fanflower	RFA priority species	endangered	no change	endangered

Family	Scientific name	Common name	RFA priority	TSPA status 2007	change	TSPA status 2002
GOODENIACEAE	<i>Velleia paradoxa</i>	Spur velleia	RFA priority species	vulnerable	no change	vulnerable
GOODENIACEAE	<i>Goodenia elongata</i>	lanky native-primrose	Not RFA priority species	not listed		
GOODENIACEAE	<i>Goodenia lanata</i>	trailing native-primrose	Not RFA priority species	not listed		
GOODENIACEAE	<i>Goodenia ovata</i>	hop native-primrose	Not RFA priority species	not listed		
GYROSTEMONACEAE	<i>Gyrostemon thesioides</i>	Broom wheel fruit	RFA priority species	rare	no change	rare
HALORAGACEAE	<i>Haloragis aspera</i>	Rough raspwort	RFA priority species	vulnerable	no change	vulnerable
HALORAGACEAE	<i>Haloragis heterophylla</i>	Variable raspwort	RFA priority species	rare	no change	rare
HALORAGACEAE	<i>Gonocarpus humilis</i>	shade raspwort	Not RFA priority species	not listed		
HALORAGACEAE	<i>Gonocarpus micranthus</i> subsp. <i>micranthus</i>	creeping raspwort	Not RFA priority species	not listed		
HALORAGACEAE	<i>Gonocarpus serpyllifolius</i>	alpine raspwort	Not RFA priority species	not listed		
HALORAGACEAE	<i>Gonocarpus tetragynus</i>	common raspwort	Not RFA priority species	not listed		
HALORAGACEAE	<i>Gonocarpus teucrioides</i>	forest raspwort	Not RFA priority species	not listed		
LAMIACEAE	<i>Mentha australis</i>	River mint	Proposed RFA priority species	endangered	new listing	not listed
LAMIACEAE	<i>Lycopus australis</i>	Native gipsywort	Proposed RFA priority species	endangered	no change	endangered
LAMIACEAE	<i>Prostanthera rotundifolia</i>	Roundleaf mint bush	RFA priority species	vulnerable	no change	vulnerable
LAMIACEAE	<i>Scutellaria humilis</i>	Dwarf scullcap	RFA priority species	rare	no change	rare
LAMIACEAE	<i>Teucrium corymbosum</i>	Forest germander	RFA priority species	rare	no change	rare
LAMIACEAE	<i>Westringia angustifolia</i>	Scabrous westringia	RFA priority species	rare	no change	rare
LAMIACEAE	<i>Westringia brevifolia</i> var. <i>raleighii</i>	Native rosemary	RFA priority species	rare	no change	rare
LAMIACEAE	<i>Ajuga australis</i>	australian bugle	Not RFA priority species	not listed		
LAMIACEAE	<i>Mentha diemenica</i> var. <i>diemenica</i>	slender mint	Not RFA priority species	not listed		
LAMIACEAE	<i>Mentha diemenica</i> var. <i>serpyllifolia</i>	thymeleaf mint	Not RFA priority species	not listed		
LAMIACEAE	<i>Prostanthera lasianthos</i> var. <i>lasianthos</i>	christmas mintbush	Not RFA priority species	not listed		
LAMIACEAE	<i>Westringia brevifolia</i> var. <i>brevifolia</i>	shortleaf westringia	Not RFA priority species	not listed		
LAMIACEAE	<i>Westringia rubiaefolia</i>	sticky westringia	Not RFA priority species	not listed		
LAURACEAE	<i>Cassytha glabella</i>	slender dodderlaurel	Not RFA priority species	not listed		
LAURACEAE	<i>Cassytha melantha</i>	large dodderlaurel	Not RFA priority species	not listed		
LAURACEAE	<i>Cassytha pubescens</i>	downy dodderlaurel	Not RFA priority species	not listed		
LOGANIACEAE	<i>Mitrasacme pilosa</i> var. <i>pilosa</i>	hairy mitrewort	Not RFA priority species	not listed		
LOGANIACEAE	<i>Mitrasacme pilosa</i> var. <i>stuartii</i>	stalked hairy mitrewort	Not RFA priority species	not listed		
LYTHRACEAE	<i>Lythrum salicaria</i>	Purple loosestrife	Proposed RFA priority species	vulnerable	no change	vulnerable
LYTHRACEAE	<i>Lythrum hyssopifolia</i>	small loosestrife	Not RFA priority species	not listed		
MALVACEAE	<i>Gynatrix pulchella</i>	Common hemp bush	RFA priority species	rare	no change	rare
MALVACEAE	<i>Asterotrichion discolor</i>	tasmanian currajong	Not RFA priority species	not listed		
MIMOSACEAE	<i>Acacia mucronata</i> subsp. <i>dependens</i>	Variable willow wattle	Proposed RFA priority species	rare	no change	rare
MIMOSACEAE	<i>Acacia retinodes</i> var. <i>uncifolia</i>	Wirilda	Proposed RFA priority species	rare	no change	rare
MIMOSACEAE	<i>Acacia siculiformis</i>	Dagger wattle	Proposed RFA priority species	rare	no change	rare
MIMOSACEAE	<i>Acacia axillaris</i>	Midlands wattle	RFA priority species	vulnerable	no change	vulnerable

Family	Scientific name	Common name	RFA priority	TSPA status 2007	change	TSPA status 2002
MIMOSACEAE	<i>Acacia pataczekii</i>	Wally's wattle	RFA priority species	rare	no change	rare
MIMOSACEAE	<i>Acacia ulicifolia</i>	juniper wattle	RFA priority species	rare	no change	rare
MIMOSACEAE	<i>Acacia dealbata</i> subsp. <i>dealbata</i>	silver wattle	Not RFA priority species	not listed		
MIMOSACEAE	<i>Acacia genistifolia</i>	spreading wattle	Not RFA priority species	not listed		
MIMOSACEAE	<i>Acacia gunnii</i>	ploughshare wattle	Not RFA priority species	not listed		
MIMOSACEAE	<i>Acacia implexa</i>	hickory wattle	Not RFA priority species	not listed		
MIMOSACEAE	<i>Acacia longifolia</i> subsp. <i>longifolia</i>	Sydney coast wattle	Not RFA priority species	not listed		
MIMOSACEAE	<i>Acacia longifolia</i> subsp. <i>sophorae</i>	coast wattle	Not RFA priority species	not listed		
MIMOSACEAE	<i>Acacia mearnsii</i>	black wattle	Not RFA priority species	not listed		
MIMOSACEAE	<i>Acacia melanoxylon</i>	blackwood	Not RFA priority species	not listed		
MIMOSACEAE	<i>Acacia mucronata</i> subsp. <i>longifolia</i>	longleaf caterpillar wattle	Not RFA priority species	not listed		
MIMOSACEAE	<i>Acacia mucronata</i> subsp. <i>mucronata</i>	erect caterpillar wattle	Not RFA priority species	not listed		
MIMOSACEAE	<i>Acacia myrtifolia</i>	redstem wattle	Not RFA priority species	not listed		
MIMOSACEAE	<i>Acacia riceana</i>	arching wattle	Not RFA priority species	not listed		
MIMOSACEAE	<i>Acacia stricta</i>	hop wattle	Not RFA priority species	not listed		
MIMOSACEAE	<i>Acacia suaveolens</i>	sweet wattle	Not RFA priority species	not listed		
MIMOSACEAE	<i>Acacia terminalis</i>	sunshine wattle	Not RFA priority species	not listed		
MIMOSACEAE	<i>Acacia verniciflua</i>	varnish wattle	Not RFA priority species	not listed		
MIMOSACEAE	<i>Acacia verticillata</i> subsp. <i>ovoidea</i>	prostrate prickly moses	Not RFA priority species	not listed		
MIMOSACEAE	<i>Acacia verticillata</i> subsp. <i>ruscifolia</i>	broadleaf prickly moses	Not RFA priority species	not listed		
MIMOSACEAE	<i>Acacia verticillata</i> subsp. <i>verticillata</i>	prickly moses	Not RFA priority species	not listed		
MONIMIACEAE	<i>Hedycarya angustifolia</i>	Austral mulberry	RFA priority species	rare	no change	rare
MONIMIACEAE	<i>Atherosperma moschatum</i>	sassafras	Not RFA priority species	not listed		
MYRTACEAE	<i>Eucalyptus gunnii</i> subsp. <i>divaricata</i>	Miena cider gum	Proposed RFA priority species	endangered	new listing	not listed
MYRTACEAE	<i>Eucalyptus barberi</i>	Barbers gum	RFA priority species	rare	no change	rare
MYRTACEAE	<i>Eucalyptus globulus</i> subsp. <i>pseudoglobulus</i>	Gippsland blue gum	RFA priority species	rare	no change	rare
MYRTACEAE	<i>Eucalyptus morrisbyi</i>	Morrisby's gum	RFA priority species	endangered	no change	endangered
MYRTACEAE	<i>Eucalyptus perriniana</i>	Spinning gum	RFA priority species	rare	no change	rare
MYRTACEAE	<i>Eucalyptus radiata</i> subsp. <i>robertsonii</i>	Forth River peppermint	RFA priority species	rare	no change	rare
MYRTACEAE	<i>Eucalyptus risdonii</i>	Risdon peppermint	RFA priority species	rare	no change	rare
MYRTACEAE	<i>Melaleuca pustulata</i>	Cranbrook paperbark	RFA priority species	rare	no change	rare
MYRTACEAE	<i>Thryptomene micrantha</i>	Ribbed thryptomene	RFA priority species	rare	no change	rare
MYRTACEAE	<i>Callistemon pallidus</i>	yellow bottlebrush	Not RFA priority species	not listed		
MYRTACEAE	<i>Callistemon viridiflorus</i>	prickly bottlebrush	Not RFA priority species	not listed		
MYRTACEAE	<i>Calytrix tetragona</i>	common fringemyrtle	Not RFA priority species	not listed		
MYRTACEAE	<i>Eucalyptus amygdalina</i>	black peppermint	Not RFA priority species	not listed		

Family	Scientific name	Common name	RFA priority	TSPA status 2007	change	TSPA status 2002
MYRTACEAE	<i>Eucalyptus archeri</i>	alpine cider gum	RFA priority species	not listed		
MYRTACEAE	<i>Eucalyptus brookeriana</i>	brookers gum	Not RFA priority species	not listed		
MYRTACEAE	<i>Eucalyptus coccifera</i>	snow peppermint	Not RFA priority species	not listed		
MYRTACEAE	<i>Eucalyptus cordata</i>	tasmanian silver gum	RFA priority species	not listed		
MYRTACEAE	<i>Eucalyptus dalrympleana</i> subsp. <i>dalrympleana</i>	mountain white gum	Not RFA priority species	not listed		
MYRTACEAE	<i>Eucalyptus delegatensis</i> subsp. <i>tasmaniensis</i>	gumtopped stringybark	Not RFA priority species	not listed		
MYRTACEAE	<i>Eucalyptus globulus</i> subsp. <i>globulus</i>	Tasmanian blue gum	Not RFA priority species	not listed		
MYRTACEAE	<i>Eucalyptus gunnii</i> subsp. <i>gunnii</i>	cider gum	Not RFA priority species	not listed		
MYRTACEAE	<i>Eucalyptus johnstonii</i>	yellow gum	Not RFA priority species	not listed		
MYRTACEAE	<i>Eucalyptus nitida</i>	western peppermint	Not RFA priority species	not listed		
MYRTACEAE	<i>Eucalyptus obliqua</i>	stringybark	Not RFA priority species	not listed		
MYRTACEAE	<i>Eucalyptus ovata</i>	black gum	Not RFA priority species	not listed		
MYRTACEAE	<i>Eucalyptus pauciflora</i> subsp. <i>pauciflora</i>	cabbage gum	Not RFA priority species	not listed		
MYRTACEAE	<i>Eucalyptus pulchella</i>	white peppermint	Not RFA priority species	not listed		
MYRTACEAE	<i>Eucalyptus regnans</i>	giant ash	Not RFA priority species	not listed		
MYRTACEAE	<i>Eucalyptus rodwayi</i>	swamp peppermint	Not RFA priority species	not listed		
MYRTACEAE	<i>Eucalyptus rubida</i>	candlebark	Not RFA priority species	not listed		
MYRTACEAE	<i>Eucalyptus sieberi</i>	ironbark	Not RFA priority species	not listed		
MYRTACEAE	<i>Eucalyptus subcrenulata</i>	alpine yellow gum	Not RFA priority species	not listed		
MYRTACEAE	<i>Eucalyptus tenuiramis</i>	silver peppermint	Not RFA priority species	not listed		
MYRTACEAE	<i>Eucalyptus urnigera</i>	urn gum	Not RFA priority species	not listed		
MYRTACEAE	<i>Eucalyptus vernicosa</i>	varnished gum	Not RFA priority species	not listed		
MYRTACEAE	<i>Eucalyptus viminalis</i> subsp. <i>viminalis</i>	white gum	Not RFA priority species	not listed		
MYRTACEAE	<i>Euryomyrtus ramosissima</i> subsp. <i>prostrata</i>	creeping heathmyrtle	Not RFA priority species	not listed		
MYRTACEAE	<i>Euryomyrtus ramosissima</i> subsp. <i>ramosissima</i>	rosy heathmyrtle	Not RFA priority species	not listed		
MYRTACEAE	<i>Kunzea ambigua</i>	white kunzea	Not RFA priority species	not listed		
MYRTACEAE	<i>Leptospermum glaucescens</i>	smoky teatree	Not RFA priority species	not listed		
MYRTACEAE	<i>Leptospermum grandiflorum</i>	autumn teatree	Not RFA priority species	not listed		
MYRTACEAE	<i>Leptospermum lanigerum</i>	woolly teatree	Not RFA priority species	not listed		
MYRTACEAE	<i>Leptospermum nitidum</i>	shiny teatree	Not RFA priority species	not listed		
MYRTACEAE	<i>Leptospermum riparium</i>	river teatree	Not RFA priority species	not listed		
MYRTACEAE	<i>Leptospermum rupestre</i>	mountain teatree	Not RFA priority species	not listed		
MYRTACEAE	<i>Leptospermum scoparium</i> var. <i>scoparium</i>	common teatree	Not RFA priority species	not listed		
MYRTACEAE	<i>Melaleuca ericifolia</i>	coast paperbark	Not RFA priority species	not listed		

Family	Scientific name	Common name	RFA priority	TSPA status 2007	change	TSPA status 2002
MYRTACEAE	<i>Melaleuca gibbosa</i>	slender honeymyrtle	Not RFA priority species	not listed		
MYRTACEAE	<i>Melaleuca squamea</i>	swamp honeymyrtle	Not RFA priority species	not listed		
MYRTACEAE	<i>Melaleuca squarrosa</i>	scented paperbark	Not RFA priority species	not listed		
OLEACEAE	<i>Notelaea ligustrina</i>	native olive	Not RFA priority species	not listed		
ONAGRACEAE	<i>Epilobium perpusillum</i>	tiny willowherb	Not RFA priority species	not listed		
OXALIDACEAE	<i>Oxalis exilis</i>	feeble woodsorrel	Not RFA priority species	not listed		
OXALIDACEAE	<i>Oxalis magellanica</i>	snowdrop woodsorrel	Not RFA priority species	not listed		
OXALIDACEAE	<i>Oxalis perennans</i>	grassland woodsorrel	Not RFA priority species	not listed		
PITTOSPORACEAE	<i>Rhytidosporum inconspicuum</i>	Alpine appleberry	Proposed RFA priority species	endangered	no change	endangered
PITTOSPORACEAE	<i>Billardiera heterophylla</i>	bluebell creeper	Not RFA priority species	not listed		
PITTOSPORACEAE	<i>Billardiera macrantha</i>	highland appleberry	Not RFA priority species	not listed		
PITTOSPORACEAE	<i>Billardiera longiflora</i>	purple appleberry	Not RFA priority species	not listed		
PITTOSPORACEAE	<i>Billardiera mutabilis</i>	green appleberry	Not RFA priority species	not listed		
PITTOSPORACEAE	<i>Billardiera nesophila</i>	coastal appleberry	Not RFA priority species	not listed		
PITTOSPORACEAE	<i>Billardiera ovalis</i>	seaspray appleberry	Not RFA priority species	not listed		
PITTOSPORACEAE	<i>Billardiera viridiflora</i>	northwest appleberry	Not RFA priority species	not listed		
PITTOSPORACEAE	<i>Bursaria spinosa</i>	prickly box	Not RFA priority species	not listed		
PITTOSPORACEAE	<i>Pittosporum bicolor</i>	cheesewood	Not RFA priority species	not listed		
PLANTAGINACEAE	<i>Plantago debilis</i>	Shade plantain	RFA priority species	rare	no change	rare
PLANTAGINACEAE	<i>Plantago gaudichaudii</i>	Narrow plantain	RFA priority species	vulnerable	no change	vulnerable
PLANTAGINACEAE	<i>Plantago varia</i>	variable plantain	Not RFA priority species	not listed		
POLYGALACEAE	<i>Comesperma defoliatum</i>	Leafless milkwort	Proposed RFA priority species	rare	no change	rare
POLYGALACEAE	<i>Comesperma volubile</i>	blue lovecreeper	Not RFA priority species	not listed		
POLYGONACEAE	<i>Muehlenbeckia axillaris</i>	matted lignum	Proposed RFA priority species	rare	no change	rare
POLYGONACEAE	<i>Persicaria decipiens</i>	slender knotweed	RFA priority species	vulnerable	no change	vulnerable
POLYGONACEAE	<i>Persicaria subsessilis</i>	bristly knotweed	RFA priority species	endangered	no change	endangered
POLYGONACEAE	<i>Muehlenbeckia adpressa</i>	climbing lignum	Not RFA priority species	not listed		
POLYGONACEAE	<i>Muehlenbeckia gunnii</i>	forest lignum	Not RFA priority species	not listed		
POLYGONACEAE	<i>Polygonum arenastrum</i>	small wireweed	Not RFA priority species	not listed		
POLYGONACEAE	<i>Rumex dumosus</i>	wiry dock	Not RFA priority species	not listed		
POLYPODIACEAE	<i>Microsorium pustulatum</i> subsp. <i>pustulatum</i>	kangaroo fern	Not RFA priority species	not listed		
PROTEACEAE	<i>Grevillea australis</i> var. <i>planifolia</i>	Flat-leaf southern grevillea	Proposed RFA priority species	rare	no change	rare
PROTEACEAE	<i>Isopogon ceratophyllus</i>	Horn cone bush	Proposed RFA priority species	vulnerable	no change	vulnerable
PROTEACEAE	<i>Persoonia gunnii</i> var. <i>oblanceolata</i>	Gunn's geebung	Proposed RFA priority species	rare	no change	rare
PROTEACEAE	<i>Persoonia muelleri</i> subsp. <i>angustifolia</i>	Mueller's geebung	Proposed RFA priority species	rare	no change	rare
PROTEACEAE	<i>Banksia serrata</i>	saw banksia	RFA priority species	rare	no change	rare
PROTEACEAE	<i>Conospermum hookeri</i>	Variable smoke bush	RFA priority species	vulnerable	no change	vulnerable
PROTEACEAE	<i>Grevillea australis</i> var. <i>linearifolia</i>	Narrow-leaf southern grevillea	RFA priority species	rare	no change	rare

Family	Scientific name	Common name	RFA priority	TSPA status 2007	change	TSPA status 2002
PROTEACEAE	<i>Hakea ulicina</i>	furze hakea	RFA priority species	vulnerable	no change	vulnerable
PROTEACEAE	<i>Lomatia tasmanica</i>	King's lomatia	RFA priority species	endangered	no change	endangered
PROTEACEAE	<i>Agastachys odorata</i>	fragrant candlebush	Not RFA priority species	not listed		
PROTEACEAE	<i>Banksia marginata</i>	silver banksia	Not RFA priority species	not listed		
PROTEACEAE	<i>Bellenden montana</i>	mountain rocket	Not RFA priority species	not listed		
PROTEACEAE	<i>Cenarrhenes nitida</i>	native plum	Not RFA priority species	not listed		
PROTEACEAE	<i>Grevillea australis</i> var. <i>australis</i>	southern grevillea	Not RFA priority species	not listed		
PROTEACEAE	<i>Grevillea australis</i> var. <i>brevifolia</i>	shortleaf grevillea	Not RFA priority species	not listed		
PROTEACEAE	<i>Grevillea australis</i> var. <i>erecta</i>	erect grevillea	Not RFA priority species	not listed		
PROTEACEAE	<i>Grevillea australis</i> var. <i>montana</i>	alpine grevillea	Not RFA priority species	not listed		
PROTEACEAE	<i>Grevillea australis</i> var. <i>planifolia</i>	flatleaf grevillea	Not RFA priority species	not listed		
PROTEACEAE	<i>Grevillea australis</i> var. <i>subulata</i>	leathery grevillea	Not RFA priority species	not listed		
PROTEACEAE	<i>Grevillea australis</i> var. <i>tenuifolia</i>	slender grevillea	RFA priority species	not listed		
PROTEACEAE	<i>Hakea decurrens</i> subsp. <i>physocarpa</i>	bushy needlebush	Not RFA priority species	not listed		
PROTEACEAE	<i>Hakea epiglottis</i> subsp. <i>epiglottis</i>	beaked needlebush	Not RFA priority species	not listed		
PROTEACEAE	<i>Hakea epiglottis</i> subsp. <i>milliganii</i>	western beaked needlebush	Not RFA priority species	not listed		
PROTEACEAE	<i>Hakea lissosperma</i>	mountain needlebush	Not RFA priority species	not listed		
PROTEACEAE	<i>Hakea microcarpa</i>	smallfruit needlebush	Not RFA priority species	not listed		
PROTEACEAE	<i>Hakea nodosa</i>	yellow needlebush	Not RFA priority species	not listed		
PROTEACEAE	<i>Hakea teretifolia</i> subsp. <i>hirsuta</i>	dagger needlebush	Not RFA priority species	not listed		
PROTEACEAE	<i>Lomatia polymorpha</i>	mountain guitarplant	Not RFA priority species	not listed		
PROTEACEAE	<i>Lomatia tinctoria</i>	guitarplant	Not RFA priority species	not listed		
PROTEACEAE	<i>Orites acicularis</i>	yellow orites	Not RFA priority species	not listed		
PROTEACEAE	<i>Orites diversifolia</i>	variable orites	Not RFA priority species	not listed		
PROTEACEAE	<i>Orites revoluta</i>	revolute orites	Not RFA priority species	not listed		
PROTEACEAE	<i>Persoonia juniperina</i> var. <i>brevifolia</i>	shortleaf geebung	Not RFA priority species	not listed		
PROTEACEAE	<i>Persoonia juniperina</i> var. <i>brevifolia</i>	shortleaf geebung	Not RFA priority species	not listed		
PROTEACEAE	<i>Persoonia juniperina</i> var. <i>juniperina</i>	prickly geebung	Not RFA priority species	not listed		
PROTEACEAE	<i>Persoonia juniperina</i> var. <i>mollis</i>	soft geebung	Not RFA priority species	not listed		
PROTEACEAE	<i>Persoonia juniperina</i> var. <i>ulicina</i>	coast geebung	Not RFA priority species	not listed		
PROTEACEAE	<i>Persoonia muelleri</i> subsp. <i>angustifolia</i>	narrowleaf geebung	Not RFA priority species	not listed		
PROTEACEAE	<i>Persoonia muelleri</i> subsp. <i>densifolia</i>	leafy geebung	Not RFA priority species	not listed		
PROTEACEAE	<i>Persoonia muelleri</i> subsp. <i>muelleri</i>	highland geebung	Not RFA priority species	not listed		
PROTEACEAE	<i>Telopea truncata</i>	tasmanian waratah	Not RFA priority species	not listed		
RANUNCULACEAE	<i>Ranunculus pumilio</i> var. <i>pumilio</i>	Ferny buttercup	Proposed RFA priority species	rare	no change	rare
RANUNCULACEAE	<i>Ranunculus sessiliflorus</i> var. <i>sessiliflorus</i>	Annual buttercup	Proposed RFA priority species	rare	no change	rare

Family	Scientific name	Common name	RFA priority	TSPA status 2007	change	TSPA status 2002
RANUNCULACEAE	<i>Clematis aristata</i>	mountain clematis	Not RFA priority species	not listed		
RANUNCULACEAE	<i>Clematis gentianoides</i>	ground clematis	Not RFA priority species	not listed		
RANUNCULACEAE	<i>Clematis microphylla</i>	small-leaf clematis	Not RFA priority species	not listed		
RANUNCULACEAE	<i>Ranunculus decurvus</i>	nodding buttercup	Not RFA priority species	not listed		
RANUNCULACEAE	<i>Ranunculus lappaceus</i>	woodland buttercup	Not RFA priority species	not listed		
RHAMNACEAE	<i>Pomaderris oraria</i> subsp. <i>oraria</i>	coast pomaderris	Proposed RFA priority species	rare	no change	rare
RHAMNACEAE	<i>Spyridium eriocephalum</i> var. <i>eriocephalum</i>	heath spyridium	Proposed RFA priority species	endangered	no change	endangered
RHAMNACEAE	<i>Cryptandra amara</i>	bitter cryptandra	RFA priority species	endangered	no change	endangered
RHAMNACEAE	<i>Discaria pubescens</i>	hairy anchor plant	RFA priority species	endangered	no change	endangered
RHAMNACEAE	<i>Pomaderris elachophylla</i>	small leaf pomaderris	RFA priority species	vulnerable	no change	vulnerable
RHAMNACEAE	<i>Pomaderris intermedia</i>	tree pomaderris	RFA priority species	rare	no change	rare
RHAMNACEAE	<i>Pomaderris phyllicifolia</i> subsp. <i>phyllicifolia</i>	narrow leaf pomaderris	RFA priority species	rare	no change	rare
RHAMNACEAE	<i>Spyridium lawrencei</i>	small leaf spyridium	RFA priority species	vulnerable	no change	vulnerable
RHAMNACEAE	<i>Spyridium obcordatum</i>	creeping spyridium	RFA priority species	vulnerable	no change	vulnerable
RHAMNACEAE	<i>Spyridium parvifolium</i> var. <i>molle</i>	soft furneaux spyridium	RFA priority species	rare	no change	rare
RHAMNACEAE	<i>Spyridium parvifolium</i> var. <i>parvifolium</i>	Australian dusty miller	RFA priority species	rare	no change	rare
RHAMNACEAE	<i>Spyridium vexilliferum</i>	winged spyridium	RFA priority species	rare	no change	rare
RHAMNACEAE	<i>Stenanthemum pimeleoides</i>	spreading stenanthemum	RFA priority species	vulnerable	no change	vulnerable
RHAMNACEAE	<i>Cryptandra exilis</i>	slender pearlflower	Not RFA priority species	not listed		
RHAMNACEAE	<i>Pomaderris apetala</i> subsp. <i>apetala</i>	common dogwood	Not RFA priority species	not listed		
RHAMNACEAE	<i>Pomaderris apetala</i> subsp. <i>maritima</i>	coast dogwood	Not RFA priority species	not listed		
RHAMNACEAE	<i>Pomaderris aspera</i>	hazel dogwood	Not RFA priority species	not listed		
RHAMNACEAE	<i>Pomaderris elliptica</i> var. <i>diemenica</i>	tasmanian yellow dogwood	Not RFA priority species	not listed		
RHAMNACEAE	<i>Pomaderris elliptica</i> var. <i>elliptica</i>	yellow dogwood	Not RFA priority species	not listed		
RHAMNACEAE	<i>Pomaderris pilifera</i>	hairy dogwood	Not RFA priority species	not listed		
RHAMNACEAE	<i>Pomaderris racemosa</i>	slender dogwood	Not RFA priority species	not listed		
RHAMNACEAE	<i>Spyridium gunnii</i>	forest dustymiller	Not RFA priority species	not listed		
RHAMNACEAE	<i>Spyridium obovatum</i> var. <i>obovatum</i>	smooth dustymiller	Not RFA priority species	not listed		
RHAMNACEAE	<i>Spyridium obovatum</i> var. <i>velutinum</i>	velvet dustymiller	Not RFA priority species	not listed		
RHAMNACEAE	<i>Spyridium ulicinum</i>	scented dustymiller	Not RFA priority species	not listed		
ROSACEAE	<i>Acaena echinata</i>	spiny sheepsburr	Not RFA priority species	not listed		
ROSACEAE	<i>Acaena novae-zelandiae</i>	common buzzy	Not RFA priority species	not listed		
ROSACEAE	<i>Acaena ovina</i>	sheepsburr	Not RFA priority species	not listed		
ROSACEAE	<i>Rubus gunnianus</i>	alpine raspberry	Not RFA priority species	not listed		

Family	Scientific name	Common name	RFA priority	TSPA status 2007	change	TSPA status 2002
ROSACEAE	<i>Rubus parvifolius</i>	native raspberry	Not RFA priority species	not listed		
RUBIACEAE	<i>Asperula minima</i>	grassy woodruff	RFA priority species	rare	no change	rare
RUBIACEAE	<i>Asperula scoparia</i> var. <i>scoparia</i>	prickly woodruff	RFA priority species	rare	no change	rare
RUBIACEAE	<i>Asperula subsimplex</i>	water woodruff	RFA priority species	rare	no change	rare
RUBIACEAE	<i>Asperula conferta</i> var. <i>abbreviata</i>	crowded common woodruff	Not RFA priority species	not listed		
RUBIACEAE	<i>Asperula conferta</i> var. <i>conferta</i>	common woodruff	Not RFA priority species	not listed		
RUBIACEAE	<i>Asperula conferta</i> var. <i>scoparioides</i>	prickly common woodruff	Not RFA priority species	not listed		
RUBIACEAE	<i>Coprosma hirtella</i>	coffeeberry	Not RFA priority species	not listed		
RUBIACEAE	<i>Coprosma nitida</i>	mountain currant	Not RFA priority species	not listed		
RUBIACEAE	<i>Coprosma quadrifida</i>	native currant	Not RFA priority species	not listed		
RUBIACEAE	<i>Galium australe</i>	tangled bedstraw	Not RFA priority species	not listed		
RUBIACEAE	<i>Galium ciliare</i>	hairy bedstraw	Not RFA priority species	not listed		
RUBIACEAE	<i>Galium gaudichaudii</i>	rough bedstraw	Not RFA priority species	not listed		
RUBIACEAE	<i>Nertera granadensis</i>	orange cushionbeads	Not RFA priority species	not listed		
RUBIACEAE	<i>Opercularia ovata</i>	broadleaf stinkweed	Not RFA priority species	not listed		
RUBIACEAE	<i>Opercularia varia</i>	variable stinkweed	Not RFA priority species	not listed		
RUTACEAE	<i>Boronia gunnii</i>	Gunn's boronia	Proposed RFA priority species	vulnerable	new listing	not listed
RUTACEAE	<i>Boronia hemichiton</i>	Mt Arthur boronia	Proposed RFA priority species	endangered	new listing	not listed
RUTACEAE	<i>Boronia hippopala</i>	velvet boronia	Proposed RFA priority species	vulnerable	new listing	not listed
RUTACEAE	<i>Zieria littoralis</i>	dwarf zieria	Proposed RFA priority species	rare	no change	rare
RUTACEAE	<i>Zieria veronicea</i> subsp. <i>veronicea</i>	pink zieria	Proposed RFA priority species	rare	no change	rare
RUTACEAE	<i>Phebalium daviesii</i>	Davies' wax flower	RFA priority species	endangered	no change	endangered
RUTACEAE	<i>Acradenia frankliniae</i>	whitey wood	Not RFA priority species	not listed		
RUTACEAE	<i>Boronia anemonifolia</i> subsp. <i>variabilis</i>	stinky boronia	Not RFA priority species	not listed		
RUTACEAE	<i>Boronia citriodora</i> subsp. <i>citriodora</i>	central lemon boronia	Not RFA priority species	not listed		
RUTACEAE	<i>Boronia citriodora</i> subsp. <i>orientalis</i>	Mt Barrow lemon boronia	Not RFA priority species	not listed		
RUTACEAE	<i>Boronia citriodora</i> subsp. <i>paulwilsonii</i>	leggy lemon boronia	Not RFA priority species	not listed		
RUTACEAE	<i>Boronia elisabethiae</i>	creeping boronia	Not RFA priority species	not listed		
RUTACEAE	<i>Boronia nana</i> var. <i>hyssopifolia</i>	simple-leaf dwarf boronia	Not RFA priority species	not listed		
RUTACEAE	<i>Boronia parviflora</i>	swamp boronia	Not RFA priority species	not listed		
RUTACEAE	<i>Boronia pilosa</i> subsp. <i>pilosa</i>	hairy boronia	Not RFA priority species	not listed		
RUTACEAE	<i>Boronia pilosa</i> subsp. <i>tasmanensis</i>	Tasman hairy boronia	Not RFA priority species	not listed		
RUTACEAE	<i>Boronia rhomboidea</i>	broadleaf boronia	RFA priority species	not listed		
RUTACEAE	<i>Boronia rozefeldsii</i>	Schouten boronia	Not RFA priority species	not listed		
RUTACEAE	<i>Correa alba</i> var. <i>alba</i>	white correa	Not RFA priority species	not listed		
RUTACEAE	<i>Correa backhouseana</i> var. <i>backhouseana</i>	velvet correa	Not RFA priority species	not listed		

Family	Scientific name	Common name	RFA priority	TSPA status 2007	change	TSPA status 2002
RUTACEAE	<i>Correa lawrenceana</i> var. <i>lawrenceana</i>	mountain correa	Not RFA priority species	not listed		
RUTACEAE	<i>Correa reflexa</i> var. <i>nummulariifolia</i>	roundleaf correa	Not RFA priority species	not listed		
RUTACEAE	<i>Correa reflexa</i> var. <i>reflexa</i>	common correa	Not RFA priority species	not listed		
RUTACEAE	<i>Leionema bilobum</i>	notched waxflower	Not RFA priority species	not listed		
RUTACEAE	<i>Nematolepis squamea</i> subsp. <i>retusa</i>	blunt satinwood	Not RFA priority species	not listed		
RUTACEAE	<i>Nematolepis squamea</i> subsp. <i>squamea</i>	satinwood	Not RFA priority species	not listed		
RUTACEAE	<i>Philotheca verrucosa</i>	fairly waxflower	Not RFA priority species	not listed		
RUTACEAE	<i>Philotheca virgata</i>	twiggy waxflower	Not RFA priority species	not listed		
RUTACEAE	<i>Zieria arborescens</i> subsp. <i>arborescens</i>	stinkwood	Not RFA priority species	not listed		
SANTALACEAE	<i>Exocarpos cupressiformis</i>	common native-cherry	Not RFA priority species	not listed		
SANTALACEAE	<i>Exocarpos strictus</i>	pearly native-cherry	Not RFA priority species	not listed		
SANTALACEAE	<i>Leptomeria drupacea</i>	erect currantbush	Not RFA priority species	not listed		
SAPINDACEAE	<i>Dodonaea filiformis</i>	fineleaf hopbush	Not RFA priority species	not listed		
SAPINDACEAE	<i>Dodonaea viscosa</i> subsp. <i>spatulata</i>	broadleaf hopbush	Not RFA priority species	not listed		
SCROPHULARIACEAE	<i>Euphrasia gibbsiae</i> subsp. <i>psilantherea</i>	swamp eyebright	Proposed RFA priority species	endangered	no change	endangered
SCROPHULARIACEAE	<i>Euphrasia collina</i> subsp. <i>deflexifolia</i>	eastern eyebright	RFA priority species	rare	no change	rare
SCROPHULARIACEAE	<i>Euphrasia fragosa</i>	shy eyebright	RFA priority species	endangered	no change	endangered
SCROPHULARIACEAE	<i>Euphrasia scabra</i>	yellow eyebright	RFA priority species	endangered	no change	endangered
SCROPHULARIACEAE	<i>Euphrasia semipicta</i>	Peninsula eyebright	RFA priority species	endangered	no change	endangered
SCROPHULARIACEAE	<i>Gratiola pubescens</i>	hairy brooklime	RFA priority species	vulnerable	no change	vulnerable
SCROPHULARIACEAE	<i>Veronica notabilis</i>	forest speedwell	RFA priority species	extinct	no change	extinct
SCROPHULARIACEAE	<i>Veronica plebeia</i>	trailing speedwell	RFA priority species	rare	no change	rare
SCROPHULARIACEAE	<i>Derwentia derwentiana</i> subsp. <i>derwentiana</i>	Derwent speedwell	Not RFA priority species	not listed		
SCROPHULARIACEAE	<i>Euphrasia diemenica</i>	middle eyebright	Proposed RFA priority species	not listed		
SCROPHULARIACEAE	<i>Gratiola nana</i>	matted brooklime	Not RFA priority species	not listed		
SCROPHULARIACEAE	<i>Gratiola peruviana</i>	southern brooklime	Not RFA priority species	not listed		
SCROPHULARIACEAE	<i>Gratiola pumilo</i>	dwarf brooklime	Not RFA priority species	not listed		
SCROPHULARIACEAE	<i>Limosella australis</i>	southern mudwort	Not RFA priority species	not listed		
SCROPHULARIACEAE	<i>Veronica calycina</i>	hairy speedwell	Not RFA priority species	not listed		
SCROPHULARIACEAE	<i>Veronica formosa</i>	speedwell bush	Not RFA priority species	not listed		
SCROPHULARIACEAE	<i>Veronica gracilis</i>	slender speedwell	Not RFA priority species	not listed		
SOLANACEAE	<i>Solanum opacum</i>	green berry nightshade	Proposed RFA priority species	endangered	no change	endangered
SOLANACEAE	<i>Cyphanthera tasmanica</i>	Tasmanian ray flower	RFA priority species	rare	no change	rare
SOLANACEAE	<i>Solanum laciniatum</i>	kangaroo apple	Not RFA priority species	not listed		

Family	Scientific name	Common name	RFA priority	TSPA status 2007	change	TSPA status 2002
SOLANACEAE	<i>Solanum vescum</i>	gunyang	Not RFA priority species	not listed		
STACKHOUSIACEAE	<i>Stackhousia monogyna</i>	forest candles	Not RFA priority species	not listed		
STERCULIACEAE	<i>Lasiopetalum discolor</i>	coast velvet bush	Proposed RFA priority species	rare	no change	rare
STERCULIACEAE	<i>Lasiopetalum micranthum</i>	Tasmanian velvet bush	RFA priority species	vulnerable	no change	vulnerable
STYLIDIACEAE	<i>Levenhookia dubia</i>	hairy stylewort	RFA priority species	extinct	no change	extinct
STYLIDIACEAE	<i>Stylidium armeria</i>	coastal triggerplant	Not RFA priority species	not listed		
STYLIDIACEAE	<i>Stylidium dilatatum</i>	broadleaf triggerplant	Not RFA priority species	not listed		
STYLIDIACEAE	<i>Stylidium graminifolium</i>	narrowleaf triggerplant	Not RFA priority species	not listed		
THYMELAEACEAE	<i>Pimelea pauciflora</i>	poison rice flower	Not RFA priority species	not listed	delisted	rare
THYMELAEACEAE	<i>Pimelea axiflora</i> subsp. <i>axiflora</i>	bootlace bush	RFA priority species	endangered	no change	endangered
THYMELAEACEAE	<i>Pimelea curviflora</i> var. <i>gracilis</i>	slender curved rice flower	RFA priority species	rare	no change	rare
THYMELAEACEAE	<i>Pimelea curviflora</i> var. <i>sericea</i>	curved rice flower	RFA priority species	rare	no change	rare
THYMELAEACEAE	<i>Pimelea filiformis</i>	trailing rice flower	RFA priority species	rare	no change	rare
THYMELAEACEAE	<i>Pimelea flava</i> subsp. <i>flava</i>	yellow rice flower	RFA priority species	rare	no change	rare
THYMELAEACEAE	<i>Pimelea cinerea</i>	grey riceflower	Not RFA priority species	not listed		
THYMELAEACEAE	<i>Pimelea curviflora</i>	riceflower	Proposed RFA priority species	not listed		
THYMELAEACEAE	<i>Pimelea drupacea</i>	cherry riceflower	Not RFA priority species	not listed		
THYMELAEACEAE	<i>Pimelea humilis</i>	dwarf riceflower	Not RFA priority species	not listed		
THYMELAEACEAE	<i>Pimelea ligustrina</i> subsp. <i>ligustrina</i>	tall riceflower	Not RFA priority species	not listed		
THYMELAEACEAE	<i>Pimelea linifolia</i> subsp. <i>linifolia</i>	slender riceflower	Not RFA priority species	not listed		
THYMELAEACEAE	<i>Pimelea linifolia</i> subsp. <i>linifolia</i>	slender riceflower	Not RFA priority species	not listed		
THYMELAEACEAE	<i>Pimelea linifolia</i> subsp. <i>linoides</i>	greater slender riceflower	Not RFA priority species	not listed		
THYMELAEACEAE	<i>Pimelea nivea</i>	bushmans bootlace	Not RFA priority species	not listed		
THYMELAEACEAE	<i>Pimelea phyllicoides</i>	heath riceflower	Not RFA priority species	not listed		
TREMANDRACEAE	<i>Tetradlea ciliata</i>	pink bells	Proposed RFA priority species	rare	no change	rare
TREMANDRACEAE	<i>Tetradlea gunnii</i>	shy susan	RFA priority species	endangered	no change	endangered
TREMANDRACEAE	<i>Tetradlea labillardierei</i>	glandular pinkbells	Not RFA priority species	not listed		
TREMANDRACEAE	<i>Tetradlea pilosa</i> subsp. <i>latifolia</i>	broadleaf hairy pinkbells	Not RFA priority species	not listed		
TREMANDRACEAE	<i>Tetradlea pilosa</i> subsp. <i>pilosa</i>	hairy pinkbells	Not RFA priority species	not listed		
URTICACEAE	<i>Australina pusilla</i> subsp. <i>muelleri</i>	Mueller's small shade nettle	RFA priority species	rare	no change	rare
URTICACEAE	<i>Australina pusilla</i> subsp. <i>pusilla</i>	small shade nettle	Not RFA priority species	not listed		
URTICACEAE	<i>Urtica incisa</i>	scrub nettle	Not RFA priority species	not listed		
VIOLACEAE	<i>Viola hederacea</i> subsp. <i>curtisiae</i>	Curtis' violet	Proposed RFA priority species	rare	no change	rare
VIOLACEAE	<i>Viola caleyana</i>	Swamp violet	RFA priority species	rare	no change	rare
VIOLACEAE	<i>Viola cunninghamii</i>	Cunningham's violet	RFA priority species	rare	no change	rare
VIOLACEAE	<i>Melicytus dentatus</i>	spiky violetbush	Not RFA priority species	not listed		
VIOLACEAE	<i>Viola betonicifolia</i>	showy violet	Not RFA priority species	not listed		
VIOLACEAE	<i>Viola cleistogamoides</i>	shy violet	Not RFA priority species	not listed		
VIOLACEAE	<i>Viola fuscoviolacea</i>	dusky violet	Not RFA priority species	not listed		

Family	Scientific name	Common name	RFA priority	TSPA status 2007	change	TSPA status 2002
VIOLACEAE	<i>Viola hederacea</i> subsp. <i>hederacea</i>	ivyleaf violet	Not RFA priority species	not listed		
VIOLACEAE	<i>Viola sieberiana</i>	tiny violet	Not RFA priority species	not listed		
WINTERACEAE	<i>Tasmania lanceolata</i>	mountain pepper	Not RFA priority species	not listed		

## ORDER MONOCOTYLEDONAE

BURMANNIACEAE	<i>Thismia rodwayi</i>	Fairy lanterns	RFA priority species	rare	no change	rare
CENTROLEPIDACEAE	<i>Aphelia gracilis</i>	Slender aphelia	RFA priority species	rare	no change	rare
CENTROLEPIDACEAE	<i>Aphelia pumilio</i>	Dwarf aphelia	RFA priority species	rare	no change	rare
CENTROLEPIDACEAE	<i>Centrolepis aristata</i>	pointed bristlewort	Not RFA priority species	not listed		
CENTROLEPIDACEAE	<i>Centrolepis fascicularis</i>	tufted bristlewort	Not RFA priority species	not listed		
CENTROLEPIDACEAE	<i>Centrolepis glabra</i>	smooth bristlewort	Not RFA priority species	not listed		
CENTROLEPIDACEAE	<i>Centrolepis monogyna</i>	common centrolepis	Not RFA priority species	not listed		
CENTROLEPIDACEAE	<i>Centrolepis polygyna</i>	wiry bristlewort	Not RFA priority species	not listed		
CENTROLEPIDACEAE	<i>Centrolepis strigosa</i> subsp. <i>pulvinata</i>	bassian bristlewort	Not RFA priority species	not listed		
CENTROLEPIDACEAE	<i>Centrolepis strigosa</i> subsp. <i>strigosa</i>	hairy bristlewort	Not RFA priority species	not listed		
CENTROLEPIDACEAE	<i>Gaimardia fitzgeraldii</i>	woolly pincushion	Not RFA priority species	not listed		
CENTROLEPIDACEAE	<i>Gaimardia setacea</i>	smooth pincushion	Not RFA priority species	not listed		
CYPERACEAE	<i>Gahnia rodwayi</i>	Rodway's saw sedge	Not RFA priority species	not listed	delisted	rare
CYPERACEAE	<i>Chorizandra enodis</i>	Black bristle-rush	Proposed RFA priority species	vulnerable	downlisted	extinct
CYPERACEAE	<i>Caustis pentandra</i>	Thick twist rush	Proposed RFA priority species	rare	no change	rare
CYPERACEAE	<i>Baumea gunnii</i>	Slender twig rush	RFA priority species	rare	no change	rare
CYPERACEAE	<i>Carex gunniana</i>	Mountain sedge	RFA priority species	rare	no change	rare
CYPERACEAE	<i>Carex longibrachiata</i>	Drooping sedge	RFA priority species	rare	no change	rare
CYPERACEAE	<i>Isolepis habra</i>	Alpine club rush	RFA priority species	rare	no change	rare
CYPERACEAE	<i>Isolepis stellata</i>	Star club rush	RFA priority species	rare	no change	rare
CYPERACEAE	<i>Lepidosperma tortuosum</i>	Twisting rapier sedge	RFA priority species	rare	no change	rare
CYPERACEAE	<i>Lepidosperma viscidum</i>	Sticky sword sedge	RFA priority species	rare	no change	rare
CYPERACEAE	<i>Uncinia elegans</i>	Handsome hook sedge	RFA priority species	rare	no change	rare
CYPERACEAE	<i>Carex diandra</i>	halfribbed sedge	Not RFA priority species	not listed		
CYPERACEAE	<i>Carex appressa</i>	tall sedge	Not RFA priority species	not listed		
CYPERACEAE	<i>Carex bichenoviana</i>	plains sedge	RFA priority species	not listed		
CYPERACEAE	<i>Carex breviculmis</i>	shortstem sedge	Not RFA priority species	not listed		
CYPERACEAE	<i>Carex cataractae</i>	lax yellowfruit sedge	Not RFA priority species	not listed		
CYPERACEAE	<i>Carex chlorantha</i>	greentop sedge	Not RFA priority species	not listed		
CYPERACEAE	<i>Carex tasmanica</i>	curly sedge	RFA priority species	not listed		
CYPERACEAE	<i>Ficinia nodosa</i>	knobby clubsedge	Not RFA priority species	not listed		

Family	Scientific name	Common name	RFA priority	TSPA status 2007	change	TSPA status 2002
CYPERACEAE	<i>Gahnia grandis</i>	cutting grass	Not RFA priority species	not listed		
CYPERACEAE	<i>Gahnia microstachya</i>	slender sawsedge	Not RFA priority species	not listed		
CYPERACEAE	<i>Gahnia radula</i>	thatch sawsedge	Not RFA priority species	not listed		
CYPERACEAE	<i>Gahnia sieberiana</i>	redfruit sawsedge	Not RFA priority species	not listed		
CYPERACEAE	<i>Isolepis limbata</i>	fringed clubsedge	Not RFA priority species	not listed		
CYPERACEAE	<i>Isolepis tasmanica</i>	tasmanian clubsedge	Not RFA priority species	not listed		
CYPERACEAE	<i>Lepidosperma curtisiae</i>	little sword-sedge	Not RFA priority species	not listed		
CYPERACEAE	<i>Lepidosperma elatius</i>	tall sword-sedge	Not RFA priority species	not listed		
CYPERACEAE	<i>Lepidosperma ensiforme</i>	arching sword-sedge	Not RFA priority species	not listed		
CYPERACEAE	<i>Lepidosperma globosum</i>	stiff sword-sedge	Not RFA priority species	not listed		
CYPERACEAE	<i>Lepidosperma gunnii</i>	narrow sword-sedge	Not RFA priority species	not listed		
CYPERACEAE	<i>Lepidosperma inops</i>	fan sedge	Not RFA priority species	not listed		
CYPERACEAE	<i>Lepidosperma laterale</i>	variable sword-sedge	Not RFA priority species	not listed		
CYPERACEAE	<i>Lepidosperma oldfieldii</i>	dark sword-sedge	Not RFA priority species	not listed		
CYPERACEAE	<i>Schoenus absconditus</i>	hidden bogsedge	Not RFA priority species	not listed		
CYPERACEAE	<i>Tetraria capillaris</i>	hair sedge	Not RFA priority species	not listed		
CYPERACEAE	<i>Uncinia nervosa</i>	moorland hooksedge	Not RFA priority species	not listed		
CYPERACEAE	<i>Uncinia riparia</i>	river hooksedge	Not RFA priority species	not listed		
CYPERACEAE	<i>Uncinia tenella</i>	delicate hooksedge	Not RFA priority species	not listed		
IRIDACEAE	<i>Diplarrena latifolia</i>	western flag-iris	Not RFA priority species	not listed		
IRIDACEAE	<i>Diplarrena moraea</i>	white flag-iris	Not RFA priority species	not listed		
IRIDACEAE	<i>Libertia pulchella</i> var. <i>pulchella</i>	pretty grassflag	Not RFA priority species	not listed		
IRIDACEAE	<i>Libertia pulchella</i> var. <i>pygmaea</i>	pygmy grassflag	Not RFA priority species	not listed		
IRIDACEAE	<i>Patersonia occidentalis</i>	long purpleflag	Not RFA priority species	not listed		
JUNCACEAE	<i>Juncus amabilis</i>	Gentle rush	RFA priority species	rare	no change	rare
JUNCACEAE	<i>Juncus prismatocarpus</i>	Branching rush	RFA priority species	rare	no change	rare
JUNCACEAE	<i>Juncus vaginatus</i>	Clustered rush	RFA priority species	rare	no change	rare
JUNCACEAE	<i>Juncus bassianus</i>	forest rush	Not RFA priority species	not listed		
JUNCACEAE	<i>Juncus filicaulis</i>	thread rush	Not RFA priority species	not listed		
JUNCACEAE	<i>Juncus pauciflorus</i>	looseflower rush	Not RFA priority species	not listed		
JUNCACEAE	<i>Juncus planifolius</i>	broadleaf rush	Not RFA priority species	not listed		
LILIACEAE	<i>Arthropodium strictum</i>	Chocolate lily	Proposed RFA priority species	rare	no change	rare
LILIACEAE	<i>Caesia calliantha</i>	Blue grass lily	RFA priority species	rare	no change	rare
LILIACEAE	<i>Dianella longifolia</i> var. <i>longifolia</i>	Pale flax lily	RFA priority species	rare	no change	rare
LILIACEAE	<i>Hypoxis vaginata</i>	Sheathing yellow-star	RFA priority species	rare	no change	rare
LILIACEAE	<i>Tricoryne elatior</i>	Yellow rush lily	RFA priority species	vulnerable	no change	vulnerable
LILIACEAE	<i>Arthropodium milleflorum</i>	pale vanilla-lily	Not RFA priority species	not listed		
LILIACEAE	<i>Arthropodium minus</i>	small vanilla-lily	RFA priority species	not listed		
LILIACEAE	<i>Arthropodium pendulum</i>	drooping vanilla-lily	Not RFA priority species	not listed		
LILIACEAE	<i>Bulbine glauca</i>	bluish bulbine-lily	Not RFA priority species	not listed		

Family	Scientific name	Common name	RFA priority	TSPA status 2007	change	TSPA status 2002
LILIACEAE	<i>Bulbine semibarbata</i>	smallflower leeklily	Not RFA priority species	not listed		
LILIACEAE	<i>Burchardia umbellata</i>	milkmaids	Not RFA priority species	not listed		
LILIACEAE	<i>Campynema lineare</i>	green mountainlily	Not RFA priority species	not listed		
LILIACEAE	<i>Chamaescilla corymbosa</i> var. <i>corymbosa</i>	blue stars	Not RFA priority species	not listed		
LILIACEAE	<i>Dianella amoena</i>	grassland flaxlily	Proposed RFA priority species	not listed		
LILIACEAE	<i>Dianella brevicaulis</i>	shortstem flaxlily	Not RFA priority species	not listed		
LILIACEAE	<i>Dianella revoluta</i>	spreading flaxlily	Not RFA priority species	not listed		
LILIACEAE	<i>Dianella tasmanica</i>	forest flaxlily	Not RFA priority species	not listed		
LILIACEAE	<i>Drymophila cyanocarpa</i>	turquoise berry	Not RFA priority species	not listed		
LILIACEAE	<i>Hypoxis vaginata</i> var. <i>brevistigmata</i>	sheathing yellowstar	Proposed RFA priority species	not listed		
LILIACEAE	<i>Hypoxis vaginata</i> var. <i>vaginata</i>	Sheathing yellowstar	Proposed RFA priority species	not listed		
LILIACEAE	<i>Thelionema caespitosum</i>	tufted lily	Not RFA priority species	not listed		
LILIACEAE	<i>Thysanotus patersonii</i>	twining fringelily	Not RFA priority species	not listed		
LINACEAE	<i>Linum marginale</i>	native flax	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Thelymitra benthamiana</i>	Blotched sun orchid	Proposed RFA priority species	endangered	new listing	not listed
ORCHIDACEAE	<i>Caladenia australis</i>	Southern spider orchid	Proposed RFA priority species	endangered	no change	endangered
ORCHIDACEAE	<i>Caladenia filamentosa</i>	Daddy long-legs	Proposed RFA priority species	rare	no change	rare
ORCHIDACEAE	<i>Caladenia pusilla</i>	Tiny caladenia	Proposed RFA priority species	rare	no change	rare
ORCHIDACEAE	<i>Corunastylis nuda</i>	Tiny midge orchid	Proposed RFA priority species	rare	no change	rare
ORCHIDACEAE	<i>Orthoceras strictum</i>	Horned orchid	Proposed RFA priority species	rare	no change	rare
ORCHIDACEAE	<i>Prasophyllum incorrectum</i>	Golfer's leek-orchid	Proposed RFA priority species	endangered	no change	endangered
ORCHIDACEAE	<i>Thelymitra holmesii</i>	Holmes' sun orchid	Proposed RFA priority species	rare	no change	rare
ORCHIDACEAE	<i>Thelymitra jonesii</i>	Sky-blue sun orchid	Proposed RFA priority species	endangered	no change	endangered
ORCHIDACEAE	<i>Thynninorchis huntiana</i>	Elbow orchid	Proposed RFA priority species	endangered	no change	endangered
ORCHIDACEAE	<i>Thynninorchis nothofagicola</i>	Myrtle elbow orchid	Proposed RFA priority species	endangered	no change	endangered
ORCHIDACEAE	<i>Caladenia anthracina</i>	Black-tipped spider orchid	RFA priority species	endangered	no change	endangered
ORCHIDACEAE	<i>Caladenia caudata</i>	Tailed spider orchid	RFA priority species	rare	no change	rare
ORCHIDACEAE	<i>Caladenia congesta</i>	Black-tongue caladenia	RFA priority species	endangered	no change	endangered
ORCHIDACEAE	<i>Caladenia lindleyana</i>	Lindley's spider orchid	RFA priority species	endangered	no change	endangered
ORCHIDACEAE	<i>Caladenia pallida</i>	Rosy spider orchid	RFA priority species	endangered	no change	endangered
ORCHIDACEAE	<i>Caladenia saggicola</i>	Sagg spider orchid	RFA priority species	endangered	no change	endangered
ORCHIDACEAE	<i>Caladenia sylvicola</i>	Forest fingers	RFA priority species	endangered	no change	endangered
ORCHIDACEAE	<i>Caladenia tonellii</i>	Robust fingers	RFA priority species	endangered	no change	endangered
ORCHIDACEAE	<i>Calochilus campestris</i>	Copper beard orchid	RFA priority species	endangered	no change	endangered
ORCHIDACEAE	<i>Chiloglottis trapeziformis</i>	Broad-lip bird orchid	RFA priority species	endangered	no change	endangered
ORCHIDACEAE	<i>Cryptostylis leptochila</i>	Small tongue orchid	RFA priority species	endangered	no change	endangered
ORCHIDACEAE	<i>Cyrtostylis robusta</i>	Large gnat orchid	RFA priority species	rare	no change	rare
ORCHIDACEAE	<i>Diuris palustris</i>	Swamp diuris	RFA priority species	endangered	no change	endangered

Family	Scientific name	Common name	RFA priority	TSPA status 2007	change	TSPA status 2002
ORCHIDACEAE	<i>Prasophyllum apoxychilum</i>	Tapered leek orchid	RFA priority species	endangered	no change	endangered
ORCHIDACEAE	<i>Prasophyllum milfordense</i>	Milford leek orchid	RFA priority species	endangered	no change	endangered
ORCHIDACEAE	<i>Prasophyllum montanum</i>	Mountain leek orchid	RFA priority species	endangered	no change	endangered
ORCHIDACEAE	<i>Prasophyllum perangustum</i>	Knocklofty leek orchid	RFA priority species	endangered	no change	endangered
ORCHIDACEAE	<i>Prasophyllum robustum</i>	Robust leek orchid	RFA priority species	endangered	no change	endangered
ORCHIDACEAE	<i>Prasophyllum stellatum</i>	Ben Lomond leek orchid	RFA priority species	endangered	no change	endangered
ORCHIDACEAE	<i>Prasophyllum tadgellianum</i>	Tadgell's leek orchid	RFA priority species	rare	no change	rare
ORCHIDACEAE	<i>Pterostylis atriola</i>	Snug greenhood	RFA priority species	endangered	no change	endangered
ORCHIDACEAE	<i>Pterostylis commutata</i>	Midland greenhood	RFA priority species	endangered	no change	endangered
ORCHIDACEAE	<i>Pterostylis cynnocephala</i>	Swan greenhood	RFA priority species	endangered	no change	endangered
ORCHIDACEAE	<i>Pterostylis falcata</i>	Sickle greenhood	RFA priority species	rare	no change	rare
ORCHIDACEAE	<i>Pterostylis grandiflora</i>	Superb greenhood	RFA priority species	rare	no change	rare
ORCHIDACEAE	<i>Pterostylis sanguinea</i>	Banded greenhood	RFA priority species	rare	no change	rare
ORCHIDACEAE	<i>Pterostylis squamata</i>	Ruddy greenhood	RFA priority species	rare	no change	rare
ORCHIDACEAE	<i>Pterostylis tunstallii</i>	Tunstall's greenhood	RFA priority species	endangered	no change	endangered
ORCHIDACEAE	<i>Thelymitra mucida</i>	Plum orchid	RFA priority species	rare	no change	rare
ORCHIDACEAE	<i>Thelymitra malvina</i>	Mauve-tufted sun orchid	Proposed RFA priority species	endangered	uplisted	rare
ORCHIDACEAE	<i>Anzybas unguiculatus</i>	small pelican-orchid	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Caladenia alata</i>	fairy fingers	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Caladenia atrata</i>	dark finger-orchid	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Caladenia atrochila</i>	darkheart fingers	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Caladenia clavigera</i>	clubbed spider-orchid	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Caladenia dilatata</i>	greencomb spider-orchid	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Caladenia gracilis</i>	musky finger-orchid	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Caladenia helvina</i>	summer spider-orchid	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Caladenia transitoria</i>	green finger-orchid	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Caladenia vulgaris</i>	summer fingers	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Caleana major</i>	flying duck-orchid	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Calochilus paludosus</i>	strap beard-orchid	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Calochilus robertsonii</i>	purple beard-orchid	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Corunastylis despectans</i>	sharp midge-orchid	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Corunastylis archeri</i>	elfin midge-orchid	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Corunastylis tasmanica</i>	tasmanian midge-orchid	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Corybas aconitiflorus</i>	spurred helmet-orchid	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Corysanthes diemenica</i>	stately helmet-orchid	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Corysanthes fimbriata</i>	fringed helmet-orchid	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Corysanthes incurva</i>	slaty helmet-orchid	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Crangonorchis pedoglossa</i>	prawn greenhood	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Cyrtostylis reniformis</i>	small gnat-orchid	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Diplodium alatum</i>	striped greenhood	Not RFA priority species	not listed		

Family	Scientific name	Common name	RFA priority	TSPA status 2007	change	TSPA status 2002
ORCHIDACEAE	<i>Diplodium atrans</i>	darktip greenhood	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Diplodium decurvum</i>	summer greenhood	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Dipodium roseum</i>	rosy hyacinth-orchid	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Diuris pardina</i>	leopard orchid	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Diuris sulphurea</i>	tiger orchid	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Gastrodia procera</i>	tall potato-orchid	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Gastrodia sesamoides</i>	short potato-orchid	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Glossodia major</i>	waxlip orchid	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Hymenochilus muticus</i>	midget greenhood	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Linguella nana</i>	dwarf greenhood	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Microtis arenaria</i>	notched onion-orchid	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Nemacianthus caudatus</i>	mayfly orchid	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Paracaleana minor</i>	small duck-orchid	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Pheladenia deformis</i>	blue fairies	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Plumatichilos plumosum</i>	bearded greenhood	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Plumatichilos tasmanicum</i>	small bearded greenhood	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Prasophyllum brevilabre</i>	shortlip leek-orchid	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Prasophyllum flavum</i>	yellow leek-orchid	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Prasophyllum truncatum</i>	truncate leek-orchid	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Pterostylis curta</i>	blunt greenhood	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Pterostylis dubia</i>	bluetongue greenhood	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Pterostylis foliata</i>	slender greenhood	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Pterostylis furcata</i>	forked greenhood	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Pterostylis nutans</i>	nodding greenhood	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Pterostylis pedunculata</i>	maroonhood	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Pterostylis scabrida</i>	rough greenhood	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Sarcochilus australis</i>	gunns tree-orchid	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Simpliglottis cornuta</i>	green bird-orchid	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Simpliglottis grammata</i>	small bird-orchid	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Simpliglottis gunnii</i>	tall bird-orchid	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Simpliglottis triceratops</i>	threehorned bird-orchid	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Simpliglottis valida</i>	large bird-orchid	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Speculantha parviflora</i>	tiny greenhood	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Taurantha concinna</i>	trim greenhood	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Thelymitra atronitida</i>	blackhood sun-orchid	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Thelymitra brevifolia</i>	shortleaf sun-orchid	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Thelymitra exigua</i>	short sun-orchid	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Thelymitra inflata</i>	inflated sun-orchid	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Thelymitra peniculata</i>	trim sun-orchid	Not RFA priority species	not listed		
ORCHIDACEAE	<i>Thelymitra rubra</i>	pink sun-orchid	Not RFA priority species	not listed		

Family	Scientific name	Common name	RFA priority	TSPA status 2007	change	TSPA status 2002
ORCHIDACEAE	<i>Townsonia viridis</i>	beech orchid	Not RFA priority species	not listed		
ORCHIDACEAE	<i>XTaurodium toveyanum</i>	mentone greenhood	Not RFA priority species	not listed		
POACEAE	<i>Lachnagrostis aemula</i>	blown-grass	Not RFA priority species	not listed	delisted	rare
POACEAE	<i>Agrostis australiensis</i>	southern bent	Proposed RFA priority species	rare	no change	rare
POACEAE	<i>Agrostis diemenica</i>	flat-leaf southern bent	Proposed RFA priority species	rare	no change	rare
POACEAE	<i>Amphibromus neesii</i>	swamp wallaby grass	Proposed RFA priority species	rare	no change	rare
POACEAE	<i>Aristida benthamii</i> var. <i>benthamii</i>	three-awned spear grass	Proposed RFA priority species	endangered	no change	endangered
POACEAE	<i>Austrodanthonia induta</i>	tall wallaby grass	Proposed RFA priority species	rare	no change	rare
POACEAE	<i>Lachnagrostis aequata</i>	even blown-grass	Proposed RFA priority species	rare	no change	rare
POACEAE	<i>Lachnagrostis punicea</i> subsp. <i>punicea</i>	bristle blown-grass	Proposed RFA priority species	rare	no change	rare
POACEAE	<i>Amphibromus macrorhinus</i>	long-nosed swamp wallaby grass	RFA priority species	endangered	no change	endangered
POACEAE	<i>Australopyrum velutinum</i>	mountain wheat grass	RFA priority species	rare	no change	rare
POACEAE	<i>Austrostipa bigeniculata</i>	double-jointed spear grass	RFA priority species	rare	no change	rare
POACEAE	<i>Austrostipa blackii</i>	crested spear grass	RFA priority species	rare	no change	rare
POACEAE	<i>Austrostipa nodosa</i>	knotty spear grass	RFA priority species	rare	no change	rare
POACEAE	<i>Austrostipa scabra</i>	rough spear grass	RFA priority species	rare	no change	rare
POACEAE	<i>Deyeuxia apsleyensis</i>	Apsley bent grass	RFA priority species	rare	no change	rare
POACEAE	<i>Deyeuxia benthamiana</i>	Bentham's bent grass	RFA priority species	rare	no change	rare
POACEAE	<i>Deyeuxia brachyathera</i>	short bent grass	RFA priority species	rare	no change	rare
POACEAE	<i>Deyeuxia decipiens</i>	trickery bent grass	RFA priority species	rare	no change	rare
POACEAE	<i>Deyeuxia minor</i>	small bent grass	RFA priority species	rare	no change	rare
POACEAE	<i>Dryopoa dives</i>	giant mountain grass	RFA priority species	rare	no change	rare
POACEAE	<i>Ehrharta juncea</i>	forest wire grass	RFA priority species	rare	no change	rare
POACEAE	<i>Hierochloa rariflora</i>	cane holy grass	RFA priority species	rare	no change	rare
POACEAE	<i>Poa mollis</i>	soft poa grass	RFA priority species	rare	no change	rare
POACEAE	<i>Agrostis parviflora</i>	small-flower bent	Not RFA priority species	not listed		
POACEAE	<i>Australopyrum pectinatum</i>	prickly wheat grass	Not RFA priority species	not listed		
POACEAE	<i>Austrodanthonia geniculata</i>	kneed wallaby grass	Not RFA priority species	not listed		
POACEAE	<i>Austrodanthonia racemosa</i> var. <i>racemosa</i>	stiped wallaby grass	Not RFA priority species	not listed		
POACEAE	<i>Austrofestuca hookeriana</i>	swamp fescue	Not RFA priority species	not listed		
POACEAE	<i>Austrostipa aphylla</i>	leafless spear grass	Not RFA priority species	not listed		
POACEAE	<i>Austrostipa scabra</i> subsp. <i>falcata</i>	sickle spear grass	Proposed RFA priority species	not listed		
POACEAE	<i>Austrostipa scabra</i> subsp. <i>scabra</i>	rough spear grass	Proposed RFA priority species	not listed		
POACEAE	<i>Deyeuxia contracta</i>	compact bent grass	Not RFA priority species	not listed		
POACEAE	<i>Deyeuxia frigida</i>	forest bent grass	Not RFA priority species	not listed		
POACEAE	<i>Deyeuxia quadriseta</i>	reed bent grass	Not RFA priority species	not listed		
POACEAE	<i>Deyeuxia rodwayi</i>	tasman bent grass	Not RFA priority species	not listed		
POACEAE	<i>Deyeuxia scaberula</i>	rough bent grass	Not RFA priority species	not listed		

Family	Scientific name	Common name	RFA priority	TSPA status 2007	change	TSPA status 2002
POACEAE	<i>Dichelachne inaequiglumis</i>	loose plume grass	Not RFA priority species	not listed		
POACEAE	<i>Dichelachne micrantha</i>	shorthair plume grass	Not RFA priority species	not listed		
POACEAE	<i>Dichelachne rara</i>	common plume grass	Not RFA priority species	not listed		
POACEAE	<i>Dichelachne sieberiana</i>	delicate plume grass	Not RFA priority species	not listed		
POACEAE	<i>Ehrharta acuminata</i>	swamp rice grass	Not RFA priority species	not listed		
POACEAE	<i>Ehrharta distichophylla</i>	hairy rice grass	Not RFA priority species	not listed		
POACEAE	<i>Ehrharta stipoides</i>	weeping grass	Not RFA priority species	not listed		
POACEAE	<i>Ehrharta tasmanica</i> var. <i>subalpina</i>	blue-green rice grass	Not RFA priority species	not listed		
POACEAE	<i>Ehrharta tasmanica</i> var. <i>tasmanica</i>	tasmanian rice grass	Not RFA priority species	not listed		
POACEAE	<i>Elymus scaber</i>	rough wheat grass	Not RFA priority species	not listed		
POACEAE	<i>Festuca plebeia</i>	Tasmanian fescue	RFA priority species	not listed		
POACEAE	<i>Lachnagrostis filiformis</i>	common blown grass	Not RFA priority species	not listed		
POACEAE	<i>Notodanthonia gracilis</i>	graceful wallaby grass	Not RFA priority species	not listed		
POACEAE	<i>Pentapogon quadrifidus</i> var. <i>parviflorus</i>	lesser five-awned spear grass	Not RFA priority species	not listed		
POACEAE	<i>Pentapogon quadrifidus</i> var. <i>quadrifidus</i>	five-awned spear grass	Not RFA priority species	not listed		
POACEAE	<i>Poa clelandii</i>	purplish tussock grass	Not RFA priority species	not listed		
POACEAE	<i>Poa labillardierei</i> var. <i>acris</i>	blue tussock grass	Not RFA priority species	not listed		
POACEAE	<i>Poa labillardierei</i> var. <i>labillardierei</i>	silver tussock grass	Not RFA priority species	not listed		
POACEAE	<i>Poa rodwayi</i>	velvet tussock grass	Not RFA priority species	not listed		
POACEAE	<i>Poa sieberiana</i>	grey tussock grass	Not RFA priority species	not listed		
POACEAE	<i>Poa tenera</i>	scrambling tussock grass	Not RFA priority species	not listed		
POACEAE	<i>Rytidosperma nitens</i>	shiny wallaby grass	RFA priority species	not listed		
POACEAE	<i>Themeda triandra</i>	kangaroo grass	Not RFA priority species	not listed		
RESTIONACEAE	<i>Baloskion tetraphyllum</i> subsp. <i>tetraphyllum</i>	tassel cordrush	Not RFA priority species	not listed		
RESTIONACEAE	<i>Calorophus elongatus</i>	long roperush	Not RFA priority species	not listed		
RESTIONACEAE	<i>Empodisma minus</i>	spreading roperush	Not RFA priority species	not listed		
RESTIONACEAE	<i>Eurychorda complanata</i>	flat cordrush	Not RFA priority species	not listed		
RESTIONACEAE	<i>Hypolaena fastigiata</i>	tassel roperush	Not RFA priority species	not listed		
RESTIONACEAE	<i>Leptocarpus tenax</i>	slender twinerush	Not RFA priority species	not listed		
XANTHORRHOEACEAE	<i>Xanthorrhoea arenaria</i>	Sand grass tree	Proposed RFA priority species	vulnerable	no change	vulnerable
XANTHORRHOEACEAE	<i>Xanthorrhoea bracteata</i>	Shiny grass tree	RFA priority species	vulnerable	no change	vulnerable
XANTHORRHOEACEAE	<i>Lomandra longifolia</i>	sagg	Not RFA priority species	not listed		
XANTHORRHOEACEAE	<i>Lomandra nana</i>	dwarf mat-rush	Not RFA priority species	not listed		
XANTHORRHOEACEAE	<i>Xanthorrhoea australis</i>	southern grasstree	Proposed RFA priority species	not listed		

Family	Scientific name	Common name	RFA priority	TSPA status 2007	change	TSPA status 2002
<b>ORDER</b>						
<b>PTERIDOPHYTA</b>						
ADIANTACEAE	<i>Anogramma leptophylla</i>	annual fern	RFA priority species	rare	no change	rare
ADIANTACEAE	<i>Cheilanthes distans</i>	bristly cloak fern	RFA priority species	endangered	no change	endangered
ADIANTACEAE	<i>Pellaea calidrupium</i>	hot rock fern	RFA priority species	rare	no change	rare
ADIANTACEAE	<i>Adiantum aethiopicum</i>	common maidenhair	Not RFA priority species	not listed		
ADIANTACEAE	<i>Cheilanthes austrotenuifolia</i>	green rockfern	Not RFA priority species	not listed		
ADIANTACEAE	<i>Cheilanthes sieberi</i> subsp. <i>sieberi</i>	narrow rockfern	Not RFA priority species	not listed		
ADIANTACEAE	<i>Pellaea falcata</i>	sickle fern	Not RFA priority species	not listed		
ASPLENIACEAE	<i>Asplenium hookerianum</i>	Hooker's spleenwort	RFA priority species	vulnerable	no change	vulnerable
ASPLENIACEAE	<i>Asplenium appendiculatum</i> subsp. <i>appendiculatum</i>	narrow spleenwort	Not RFA priority species	not listed		
ASPLENIACEAE	<i>Asplenium bulbiferum</i> subsp. <i>gracillimum</i>	mother spleenwort	Not RFA priority species	not listed		
ASPLENIACEAE	<i>Asplenium flabellifolium</i>	necklace fern	Not RFA priority species	not listed		
ASPLENIACEAE	<i>Asplenium flaccidum</i> subsp. <i>flaccidum</i>	weeping spleenwort	Not RFA priority species	not listed		
ASPLENIACEAE	<i>Asplenium obtusatum</i> subsp. <i>northlandicum</i>	shore spleenwort	Not RFA priority species	not listed		
ASPLENIACEAE	<i>Asplenium trichomanes</i> subsp. <i>quadrivalens</i>	limestone spleenwort	Not RFA priority species	not listed		
ASPLENIACEAE	<i>Asplenium trichomanes</i> subsp. <i>trichomanes</i>	dolerite spleenwort	RFA priority species	not listed		
ASPLENIACEAE	<i>Pleurosorus rutifolius</i>	blanket fern	Not RFA priority species	not listed		
ATHYRIACEAE	<i>Cystopteris tasmanica</i>	brittle bladderfern	Not RFA priority species	not listed		
ATHYRIACEAE	<i>Diplazium australe</i>	southern ladyfern	Not RFA priority species	not listed		
AZOLLACEAE	<i>Azolla filiculoides</i>	pacific azolla	Not RFA priority species	not listed		
BLECHNACEAE	<i>Blechnum cartilagineum</i>	Gristle fern	RFA priority species	vulnerable	no change	vulnerable
BLECHNACEAE	<i>Doodia caudata</i>	Small rasp fern	RFA priority species	vulnerable	no change	vulnerable
BLECHNACEAE	<i>Blechnum chambersii</i>	lance waterfern	Not RFA priority species	not listed		
BLECHNACEAE	<i>Blechnum fluviatile</i>	ray waterfern	Not RFA priority species	not listed		
BLECHNACEAE	<i>Blechnum minus</i>	soft waterfern	Not RFA priority species	not listed		
BLECHNACEAE	<i>Blechnum nudum</i>	fishbone waterfern	Not RFA priority species	not listed		
BLECHNACEAE	<i>Blechnum patersonii</i> subsp. <i>patersonii</i>	strap waterfern	Not RFA priority species	not listed		
BLECHNACEAE	<i>Blechnum penna-marina</i> subsp. <i>alpina</i>	alpine waterfern	Not RFA priority species	not listed		
BLECHNACEAE	<i>Blechnum vulcanicum</i>	wedge waterfern	Not RFA priority species	not listed		
BLECHNACEAE	<i>Blechnum watsii</i>	hard waterfern	Not RFA priority species	not listed		
BLECHNACEAE	<i>Doodia australis</i>	common raspfern	Not RFA priority species	not listed		
CYATHEACEAE	<i>Cyathea cunninghamii</i>	slender treefern	RFA priority species	endangered	new listing	not listed

Family	Scientific name	Common name	RFA priority	TSPA status 2007	change	TSPA status 2002
CYATHEACEAE	<i>Cyathea Xmarcescens</i>	skirted treefern	RFA priority species	vulnerable	no change	vulnerable
CYATHEACEAE	<i>Cyathea australis</i>	rough treefern	Not RFA priority species	not listed		
DENNSTAEDTIACEAE	<i>Hypolepis distans</i>	scrambling ground fern	RFA priority species	vulnerable	no change	vulnerable
DENNSTAEDTIACEAE	<i>Hypolepis muelleri</i>	harsh ground fern	RFA priority species	rare	no change	rare
DENNSTAEDTIACEAE	<i>Histiopteris incisa</i>	batswing fern	Not RFA priority species	not listed		
DENNSTAEDTIACEAE	<i>Hypolepis amaurorachis</i>	southern groundfern	Not RFA priority species	not listed		
DENNSTAEDTIACEAE	<i>Hypolepis glandulifera</i>	downy groundfern	Not RFA priority species	not listed		
DENNSTAEDTIACEAE	<i>Hypolepis rugosula</i>	ruddy groundfern	Not RFA priority species	not listed		
DENNSTAEDTIACEAE	<i>Pteridium esculentum</i>	bracken	Not RFA priority species	not listed		
DICKSONIACEAE	<i>Calochlaena dubia</i>	rainbow fern	Not RFA priority species	not listed		
DICKSONIACEAE	<i>Dicksonia antarctica</i>	soft treefern	Not RFA priority species	not listed		
DRYOPTERIDACEAE	<i>Lastreopsis acuminata</i>	shiny shieldfern	Not RFA priority species	not listed		
DRYOPTERIDACEAE	<i>Lastreopsis hispida</i>	bristly shieldfern	Not RFA priority species	not listed		
DRYOPTERIDACEAE	<i>Polystichum proliferum</i>	mother shieldfern	Not RFA priority species	not listed		
DRYOPTERIDACEAE	<i>Rumohra adiantiformis</i>	leathery shieldfern	Not RFA priority species	not listed		
GLEICHENIACEAE	<i>Gleichenia abscida</i>	dwarf coralfern	Not RFA priority species	not listed		
GLEICHENIACEAE	<i>Gleichenia alpina</i>	alpine coralfern	Not RFA priority species	not listed		
GLEICHENIACEAE	<i>Gleichenia dicarpa</i>	pouched coralfern	Not RFA priority species	not listed		
GLEICHENIACEAE	<i>Gleichenia microphylla</i>	scrambling coralfern	Not RFA priority species	not listed		
GLEICHENIACEAE	<i>Sticherus tener</i>	silky fanfern	Not RFA priority species	not listed		
GRAMMITIDACEAE	<i>Ctenopteris heterophylla</i>	gypsy fern	Not RFA priority species	not listed		
GRAMMITIDACEAE	<i>Grammitis billardierei</i>	common fingerfern	Not RFA priority species	not listed		
GRAMMITIDACEAE	<i>Grammitis magellanica</i> subsp. <i>nothofagei</i>	beech fingerfern	Not RFA priority species	not listed		
GRAMMITIDACEAE	<i>Grammitis poeppigiana</i>	alpine fingerfern	Not RFA priority species	not listed		
GRAMMITIDACEAE	<i>Grammitis pseudociliata</i>	hairy fingerfern	Not RFA priority species	not listed		
HYMENOPHYLLACEAE	<i>Crepidomanes venosum</i>	bristle filmyfern	Not RFA priority species	not listed		
HYMENOPHYLLACEAE	<i>Hymenophyllum australe</i>	southern filmyfern	Not RFA priority species	not listed		
HYMENOPHYLLACEAE	<i>Hymenophyllum cupressiforme</i>	common filmyfern	Not RFA priority species	not listed		
HYMENOPHYLLACEAE	<i>Hymenophyllum flabellatum</i>	shiny filmyfern	Not RFA priority species	not listed		
HYMENOPHYLLACEAE	<i>Hymenophyllum marginatum</i>	bordered filmyfern	Not RFA priority species	not listed		
HYMENOPHYLLACEAE	<i>Hymenophyllum peltatum</i>	alpine filmyfern	Not RFA priority species	not listed		
HYMENOPHYLLACEAE	<i>Hymenophyllum rarum</i>	narrow filmyfern	Not RFA priority species	not listed		
HYMENOPHYLLACEAE	<i>Sphaerocionium applanatum</i>	skeleton filmyfern	Not RFA priority species	not listed		
ISOETACEAE	<i>Isoetes gunnii</i>	stout quillwort	Not RFA priority species	not listed		
LINDSAEACEAE	<i>Lindsaea linearis</i>	screw fern	Not RFA priority species	not listed		
LINDSAEACEAE	<i>Lindsaea trichomanoides</i>	oval wedgefern	Not RFA priority species	not listed		
LYCOPODIACEAE	<i>Huperzia australiana</i>	mother clubmoss	Not RFA priority species	not listed		
LYCOPODIACEAE	<i>Huperzia varia</i>	long clubmoss	Not RFA priority species	not listed		
LYCOPODIACEAE	<i>Lycopodiella lateralis</i>	slender clubmoss	Not RFA priority species	not listed		

Family	Scientific name	Common name	RFA priority	TSPA status 2007	change	TSPA status 2002
LYCOPODIACEAE	<i>Lycopodium deuterodensum</i>	conifer clubmoss	Not RFA priority species	not listed		
LYCOPODIACEAE	<i>Lycopodium fastigiatum</i>	mountain clubmoss	Not RFA priority species	not listed		
LYCOPODIACEAE	<i>Lycopodium scariosum</i>	spreading clubmoss	Not RFA priority species	not listed		
OPHIOGLOSSACEAE	<i>Botrychium australe</i>	parsley fern	RFA priority species	extinct	no change	extinct
OPHIOGLOSSACEAE	<i>Botrychium lunaria</i>	moonwort	Not RFA priority species	not listed		
OPHIOGLOSSACEAE	<i>Ophioglossum lusitanicum</i> subsp. <i>coriaceum</i>	adders-tongue	Not RFA priority species	not listed		
OSMUNDACEAE	<i>Todea barbara</i>	southern kingfern	Not RFA priority species	not listed		
PSILOTACEAE	<i>Tmesipteris parva</i>	Small fork fern	RFA priority species	rare	no change	rare
PSILOTACEAE	<i>Tmesipteris elongata</i>	narrow forkfern	Not RFA priority species	not listed		
PSILOTACEAE	<i>Tmesipteris obliqua</i>	common forkfern	Not RFA priority species	not listed		
PTERIDACEAE	<i>Pteris comans</i>	netted brake	Not RFA priority species	not listed		
PTERIDACEAE	<i>Pteris tremula</i>	tender brake	Not RFA priority species	not listed		
SCHIZAEACEAE	<i>Schizaea bifida</i>	forked combfern	Not RFA priority species	not listed		
SCHIZAEACEAE	<i>Schizaea fistulosa</i>	narrow combfern	Not RFA priority species	not listed		
SELAGINELLACEAE	<i>Selaginella uliginosa</i>	swamp spikemoss	Not RFA priority species	not listed		
THELYPTERIDACEAE	<i>Pneumatopteris pennigera</i>	lime fern	RFA priority species	endangered	uplisted	vulnerable

## ORDER GYMNOSPERMAE

CUPRESSACEAE	<i>Callitris oblonga</i> subsp. <i>oblonga</i>	South Esk pine	Proposed RFA priority species	vulnerable	no change	vulnerable
CUPRESSACEAE	<i>Callitris rhomboidea</i>	Oyster Bay pine	Not RFA priority species	not listed		
CUPRESSACEAE	<i>Diselma archeri</i>	dwarf pine	Not RFA priority species	not listed		
PHYLLOCLADACEAE	<i>Phyllocladus aspleniifolius</i>	celerytop pine	Not RFA priority species	not listed		
PODOCARPACEAE	<i>Pherosphaera hookeriana</i>	drooping pine	Proposed RFA priority species	vulnerable	no change	vulnerable
PODOCARPACEAE	<i>Lagarostrobos franklinii</i>	Huon pine	Not RFA priority species	not listed		
PODOCARPACEAE	<i>Microcachrys tetragona</i>	creeping pine	Not RFA priority species	not listed		
PODOCARPACEAE	<i>Podocarpus lawrencei</i>	mountain plumpine	Not RFA priority species	not listed		
TAXODIACEAE	<i>Athrotaxis cupressoides</i>	pencil pine	Not RFA priority species	not listed		
TAXODIACEAE	<i>Athrotaxis selaginoides</i>	King Billy pine	Not RFA priority species	not listed		
TAXODIACEAE	<i>Athrotaxis Xlaxifolia</i>	hybrid pencil pine	Not RFA priority species	not listed		

## APPENDIX 1.2.b.1 EXISTING AND PROPOSED RFA PRIORITY SPECIES

Table 1.2.b(i) Vascular Flora Species listed on TSP Act or EPBC Act

Species	Common name	Prescription source	Recommendation	Basis for recommendation
<i>Acacia axillaris</i>	Midlands wattle	Listing statement		
<i>Acacia mucronata</i> subsp. <i>dependens</i>	Variable sallow wattle		Add to RFA priority species list	Previously included as <i>Acacia mucronata</i> var. <i>dependens</i>
<i>Acacia pataczekii</i>	Wally's wattle			
<i>Acacia retinodes</i> var. <i>uncifolia</i>	Wirilda		Add to RFA priority species list	Is a forest dwelling species
<i>Acacia siculiformis</i>	Dagger wattle		Add to RFA priority species list	Is a forest dwelling species
<i>Acacia ulicifolia</i>	Juniper wattle			
<i>Agrostis australiensis</i>	Southern bent		Add to RFA priority species list	Is a forest dwelling species
<i>Agrostis diemenica</i>	Flat-leaf southern bent		Add to RFA priority species list	Previously included as <i>Agrostis</i> aff. <i>australiensis</i>
<i>Allocasuarina crassa</i>	Capes she-oak			
<i>Allocasuarina duncanii</i>	Duncan's she-oak	Listing statement		
<i>Alternanthera denticulata</i>	Lesser joyweed		Add to RFA priority species list	Is a forest dwelling species
<i>Alternanthera macrorhinus</i>	Long-nosed swamp wallaby grass			
<i>Amphibromus neesii</i>	Swamp wallaby grass		Add to RFA priority species list	Is a forest dwelling species
<i>Anogramma leptophylla</i>	Annual fern	Listing statement		
<i>Aphelia gracilis</i>	Slender aphelia			
<i>Aphelia pumilio</i>	Dwarf aphelia			
<i>Argentipallium spiceri</i>	Spicer's everlasting	Listing statement, Flora Recovery Plan: Spicer's Everlasting <i>Argentipallium spiceri</i> 2006-2010		
<i>Aristida benthamii</i> var. <i>benthamii</i>	Three-awned spear grass		Add to RFA priority species list	Previously included as <i>Aristida benthamii</i>
<i>Arthropodium strictum</i>	Chocolate lily		Add to RFA priority species list	Previously included as <i>Dichopogon strictus</i>
<i>Asperula minima</i>	Grassy woodruff			
<i>Asperula scoparia</i> var. <i>scoparia</i>	Prickly woodruff			
<i>Asperula subsimplex</i>	Water woodruff			
<i>Asplenium hookerianum</i>	Hooker's spleenwort	Listing statement		
<i>Australina pusilla</i> subsp. <i>muelleri</i>	Mueller's small shade nettle			
<i>Australopyrum velutinum</i>	Mountain wheat grass			
<i>Austrocynoglossum latifolium</i>	Forest hound's tongue		Add to RFA priority species list	Previously included as <i>Cynoglossum latifolium</i>
<i>Austrodanthonia induta</i>	Tall wallaby grass		Add to RFA priority species list	Previously included as <i>Rytidosperma procerum</i>
<i>Austrostipa bigeniculata</i>	Double-jointed spear grass			
<i>Austrostipa blackii</i>	Crested spear grass			
<i>Austrostipa nodosa</i>	Knotty spear grass			

Species	Common name	Prescription source	Recommendation	Basis for recommendation
<i>Austrostipa scabra</i>	Rough spear grass			
<i>Ballantinia antipoda</i>	Southern ballantine			
<i>Banksia serrata</i>	Saw banksia			
<i>Barbarea australis</i>	Native wintercress	Listing statement, <i>Barbarea australis</i> Recovery Plan (2000)		
<i>Baumea gunnii</i>	Slender twig rush			
<i>Bedfordia arborescens</i>	Blanket leaf	Listing statement		
<i>Bertya tasmanica</i> subsp. <i>tasmanica</i>	Tasmanian bertya	Listing statement	Add to RFA priority species list	Previously included as <i>Bertya rosmarinifolia</i>
<i>Blechnum cartilagineum</i>	Gristle fern	Listing statement		
<i>Boronia gunnii</i>	Gunn's boronia		Add to RFA priority species list	Now listed on TSPA 1995
<i>Boronia hemichiton</i>	Mt Arthur boronia		Add to RFA priority species list	Now listed on TSPA 1995
<i>Boronia hippopala</i>	Velvet boronia		Add to RFA priority species list	Now listed on TSPA 1995
<i>Bossiaea obcordata</i>	Spiny bossiaea			
<i>Botrychium australe</i>	Parsley fern			
<i>Brachyglottis brunonis</i>	Brown's tree daisy			
<i>Brachyloma depressum</i>	Spreading brachyloma			
<i>Brachyscome perpusilla</i>	Tiny daisy		Add to RFA priority species list	Is a forest dwelling species
<i>Brachyscome radicata</i>	Rooted daisy			
<i>Brachyscome rigidula</i>	Hairy cutleaf daisy			
<i>Brachyscome sieberi</i> var. <i>gunnii</i>	Sieber's daisy			
<i>Brunonia australis</i>	Blue pincushion			
<i>Caesia calliantha</i>	Blue grass lily			
<i>Caladenia anthracina</i>	Black-tipped spider orchid	Listing statement, Flora Recovery Plan: Tasmanian Threatened Orchids 2006-2010		
<i>Caladenia australis</i>	Southern spider orchid	Flora Recovery Plan: Tasmanian Threatened Orchids 2006-2010	Add to RFA priority species list	Is a forest dwelling species
<i>Caladenia caudata</i>	Tailed spider orchid	Flora Recovery Plan: Tasmanian Threatened Orchids 2006-2010		
<i>Caladenia congesta</i>	Black-tongue caladenia	Flora Recovery Plan: Tasmanian Threatened Orchids 2006-2010		
<i>Caladenia filamentosa</i>	Daddy long-legs	Flora Recovery Plan: Tasmanian Threatened Orchids 2006-2010	Add to RFA priority species list	Previously included as <i>Caladenia filamentosa</i> var. <i>filamentosa</i>
<i>Caladenia lindleyana</i>	Lindley's spider orchid	Listing statement, Flora Recovery Plan: Tasmanian Threatened Orchids 2006-2010		
<i>Caladenia pallida</i>	Rosy spider orchid	Flora Recovery Plan: Tasmanian Threatened Orchids 2006-2010		
<i>Caladenia pusilla</i>	Tiny caladenia	Flora Recovery Plan: Tasmanian Threatened Orchids 2006-2010	Add to RFA priority species list	Is a forest dwelling species
<i>Caladenia saggicola</i>	Sagg spider orchid	Listing statement, Flora Recovery Plan: Tasmanian Threatened Orchids 2006-2010		

Species	Common name	Prescription source	Recommendation	Basis for recommendation
<i>Caladenia sylvicola</i>	Forest fingers	Flora Recovery Plan: Tasmanian Threatened Orchids 2006-2010		
<i>Caladenia tonellii</i>	Robust fingers	Flora Recovery Plan: Tasmanian Threatened Orchids 2006-2010		
<i>Callitris oblonga</i> subsp. <i>oblonga</i>	South Esk pine	Draft Recovery Plan: <i>Eucalyptus ovata</i> - <i>Callitris oblonga</i> Community 2006-2010	Add to RFA priority species list	Previously included as <i>Callitris</i> aff. <i>oblonga</i>
<i>Calochilus campestris</i>	Copper beard orchid	Flora Recovery Plan: Tasmanian Threatened Orchids 2006-2010		
<i>Calystegia sepium</i>	Great bindweed		Add to RFA priority species list	Is a forest dwelling species
<i>Carex gunniana</i>	Mountain sedge			
<i>Carex longibrachiata</i>	Drooping sedge			
<i>Carex tasmanica</i>	Curly sedge			
<i>Caustis pentandra</i>	Thick twist rush		Add to RFA priority species list	Is a forest dwelling species
<i>Centaurium spicatum</i>	Australian centaury			
<i>Centipeda cunninghamii</i>	Common sneezeweed			
<i>Cheilanthes distans</i>	Bristly cloak fern	Listing statement		
<i>Chiloglottis trapeziformis</i>	Broad-lip bird orchid	Flora Recovery Plan: Tasmanian Threatened Orchids 2006-2010		
<i>Chorizandra enodis</i>	Black bristle-rush		Add to RFA priority species list	Is a forest dwelling species
<i>Chrysocephalum baxteri</i>	Fringed everlasting		Add to RFA priority species list	Is a forest dwelling species
<i>Colobanthus curtisiae</i>	Curtis' colobanth	Listing statement		
<i>Comesperma defoliatum</i>	Leafless milkwort		Add to RFA priority species list	Is a forest dwelling species
<i>Conospermum hookeri</i>	Variable smoke bush	Listing statement		
<i>Cooperookia barbata</i>	Purple goodenia		Add to RFA priority species list	Previously included as <i>Goodenia barbata</i>
<i>Corunastylis nuda</i>	Tiny midge orchid	Flora Recovery Plan: Tasmanian Threatened Orchids 2006-2010	Add to RFA priority species list	Previously included as <i>Genoplesium nudum</i>
<i>Cryptandra amara</i>	Bitter cryptandra			
<i>Cryptostylis leptochila</i>	Small tongue orchid	Listing statement, Flora Recovery Plan: Tasmanian Threatened Orchids 2006-2010		
<i>Cyathea cunninghamii</i>	Slender treefern	Listing statement		Now listed on TSPA 1995
<i>Cyathea Xmarcescens</i>	Skirted treefern	Listing statement		
<i>Cyphanthera tasmanica</i>	Tasmanian ray flower			
<i>Cyrtostylis robusta</i>	Large gnat orchid	Flora Recovery Plan: Tasmanian Threatened Orchids 2006-2010		
<i>Desmodium gunnii</i>	Slender tick trefoil			As per census 1995 which includes <i>Desmodium varians</i> which was added to the 2004 vascular plant census.
<i>Deyeuxia apsleyensis</i>	Apsley bent grass			
<i>Deyeuxia benthamiana</i>	Bentham's bent grass			
<i>Deyeuxia brachyathera</i>	Short bent grass			
<i>Deyeuxia decipiens</i>	Trickery bent grass			

Species	Common name	Prescription source	Recommendation	Basis for recommendation
<i>Deyeuxia minor</i>	Small bent grass			
<i>Dianella amoena</i>	Grassland flaxlily		Add to RFA priority species list	Listed on EPBCA 1999 considered forest dependent. Research required.
<i>Dianella longifolia</i> var. <i>longifolia</i>	Pale flax lily			
<i>Discaria pubescens</i>	Hairy anchor plant			
<i>Diuris palustris</i>	Swamp diuris	Listing statement, Flora Recovery Plan: Tasmanian Threatened Orchids 2006-2010		
<i>Doodia caudata</i>	Small rasp fern	Listing statement		
<i>Dryopoa dives</i>	Giant mountain grass			
<i>Ehrharta juncea</i>	Forest wire grass			
<i>Elaeocarpus reticulatus</i>	Blueberry ash			
<i>Epacris acuminata</i>	Clasping-leaf heath	Recovery Plan for Tasmanian Forest Epacrids 1999-2004		
<i>Epacris</i> aff. <i>virgata</i> 'graniticola'	Mt Cameron heath	Recovery Plan for Tasmanian Forest Epacrids 1999-2004	Add to RFA priority species list	Previously included as <i>Epacris graniticola</i>
<i>Epacris apsleyensis</i>	Apsley heath	Recovery Plan for Tasmanian Forest Epacrids 1999-2004		
<i>Epacris barbata</i>	Bearded heath	Recovery Plan for Tasmanian Forest Epacrids 1999-2004		
<i>Epacris curtisiae</i>	Curtis' heath			
<i>Epacris exserta</i>	South Esk heath	Recovery Plan for Tasmanian Forest Epacrids 1999-2004		
<i>Epacris glabella</i>	Funnel heath	Recovery Plan for Tasmanian Forest Epacrids 1999-2004		
<i>Epacris grandis</i>	Great heath	Recovery Plan for Tasmanian Forest Epacrids 1999-2004		
<i>Epacris limbata</i>	Border heath	Recovery Plan for Tasmanian Forest Epacrids 1999-2004		
<i>Epacris virgata</i>	Pretty heath	Recovery Plan for Tasmanian Forest Epacrids 1999-2004		
<i>Eryngium ovinum</i>	Blue devil			
<i>Eucalyptus barberi</i>	Barbers gum			
<i>Eucalyptus globulus</i> subsp. <i>pseudoglobulus</i>	Gippsland blue gum			
<i>Eucalyptus gunnii</i> subsp. <i>divaricata</i>	Miena cider gum		Add to RFA priority species list	Now listed on TSPA 1995
<i>Eucalyptus morrisbyi</i>	Morrisby's gum	Flora Recovery Plan: Morrisby's gum, <i>Eucalyptus morrisbyi</i> Year 2006-2010		
<i>Eucalyptus perriniana</i>	Spinning gum			
<i>Eucalyptus radiata</i> subsp. <i>robertsonii</i>	Forth River peppermint			
<i>Eucalyptus risdonii</i>	Risdon peppermint			
<i>Euphrasia collina</i> subsp. <i>deflexifolia</i>	Eastern eyebright	Recovery Plan for Threatened Tasmanian Lowland <i>Euphrasia</i> Species (2000)		

Species	Common name	Prescription source	Recommendation	Basis for recommendation
<i>Euphrasia fragosa</i>	Shy eyebright	Listing statement, Recovery Plan for Threatened Tasmanian Lowland <i>Euphrasia</i> Species (2000)		
<i>Euphrasia gibbsiae</i> subsp. <i>psilantherea</i>	Swamp eyebright	Listing statement, Recovery Plan for Threatened Tasmanian Lowland <i>Euphrasia</i> Species (2000)	Add to RFA priority species list	Is a forest margin species
<i>Euphrasia scabra</i>	Yellow eyebright	Listing statement, Recovery Plan for Threatened Tasmanian Lowland <i>Euphrasia</i> Species (2000)		
<i>Euphrasia semipicta</i>	Peninsula eyebright	Recovery Plan for Threatened Tasmanian Lowland <i>Euphrasia</i> Species (2000)		
<i>Glycine latrobeana</i>	Clover glycine			
<i>Glycine microphylla</i>	Small-leaf glycine			
<i>Gompholobium ecostatum</i>	Dwarf wedge pea			
<i>Goodenia geniculata</i>	Bent goodenia		Add to RFA priority species list	Is a forest dwelling species
<i>Gratiola pubescens</i>	Hairy brooklime			
<i>Grevillea australis</i> var. <i>linearifolia</i>	Narrow-leaf southern grevillea			
<i>Grevillea australis</i> var. <i>planifolia</i>	Flat-leaf southern grevillea		Add to RFA priority species list	Is a forest dwelling species
<i>Gynatrix pulchella</i>	Common hemp bush			
<i>Gyrostemon thesioides</i>	Broom wheel fruit			
<i>Hakea ulicina</i>	Furze hakea			
<i>Haloragis aspera</i>	Rough raspwort			
<i>Haloragis heterophylla</i>	Variable raspwort			
<i>Hardenbergia violacea</i>	Purple coral pea	Listing statement		
<i>Hedycarya angustifolia</i>	Austral mulberry			
<i>Hibbertia calycina</i>	Lesser guinea flower			
<i>Hibbertia</i> sp. 'Pontville'	Basalt guineaflower		Add to RFA priority species list	Is a forest dwelling species
<i>Hibbertia virgata</i>	Twiggy guinea flower			
<i>Hierochloa rariflora</i>	Cane holy grass			
<i>Hovea corrickiae</i>	Glossy hovea			
<i>Hovea montana</i>	Mountain hovea		Add to RFA priority species list	Is a forest dwelling species
<i>Hovea tasmanica</i>	Hill hovea		Add to RFA priority species list	Now listed on TSPA 1995
<i>Hyalosperma demissum</i>	Moss sunray			
<i>Hydrocotyle comocarpa</i>	Fringe-fruit pennywort			
<i>Hydrocotyle laxiflora</i>	Stinking pennywort			
<i>Hypolepis distans</i>	Scrambling ground fern	Listing statement		
<i>Hypolepis muelleri</i>	Harsh ground fern			
<i>Hypoxis vaginata</i>	Sheathing yellow-star			
<i>Isoetopsis graminifolia</i>	Grass cushions			
<i>Isolepis habra</i>	Alpine club rush			
<i>Isolepis stellata</i>	Star club rush			

Species	Common name	Prescription source	Recommendation	Basis for recommendation
<i>Isopogon ceratophyllus</i>	Horny cone bush		Add to RFA priority species list	Is a forest dwelling species
<i>Juncus amabilis</i>	Gentle rush			
<i>Juncus prismatocarpus</i>	Branching rush			
<i>Juncus vaginatus</i>	Clustered rush			
<i>Lachnagrostis aequata</i>	Even blown-grass		Add to RFA priority species list	Is a forest dwelling species
<i>Lachnagrostis punicea</i> subsp. <i>punicea</i>	Bristle blown-grass		Add to RFA priority species list	Previously included as <i>Agrostis aemula</i> var. <i>setifolia</i>
<i>Lasiopetalum discolor</i>	Coast velvet bush		Add to RFA priority species list	Is a forest dwelling species
<i>Lasiopetalum micranthum</i>	Tasmanian velvet bush			
<i>Lepidium hyssopifolium</i>	Basalt peppercress			
<i>Lepidium pseudotasmanicum</i>	Shade peppercress			
<i>Lepidosperma tortuosum</i>	Twisting rapier sedge			
<i>Lepidosperma viscidum</i>	Sticky sword sedge			
<i>Leucochrysum albicans</i> subsp. <i>albicans</i> var. <i>tricolor</i>	Grassland paper daisy			
<i>Leucopogon lanceolatus</i> var. <i>lanceolatus</i>	Lance beard heath		Add to RFA priority species list	Previously included as <i>Leucopogon lanceolatus</i>
<i>Leucopogon virgatus</i> var. <i>brevifolius</i>	Shortleaf beard heath			
<i>Levenhookia dubia</i>	Hairy stylewort			
<i>Lobelia pratioides</i>	Poison lobelia			
<i>Lobelia rhombifolia</i>	Branched lobelia			
<i>Lomatia tasmanica</i>	King's lomatia	Flora Recovery Plan: King's lomatia, <i>Lomatia tasmanica</i> 2006-2010		
<i>Lycopus australis</i>	Native gipsywort		Add to RFA priority species list	Is a forest dwelling species
<i>Lythrum salicaria</i>	Purple loosestrife		Add to RFA priority species list	Is a forest dwelling species
<i>Melaleuca pustulata</i>	Cranbrook paperbark			
<i>Mentha australis</i>	River mint		Add to RFA priority species list	Is a forest dwelling species
<i>Micranthemum serpentinum</i>	Serpentine micranthemum	Listing statement		
<i>Mirbelia oxylobioides</i>	Mountain mirbelia			
<i>Monotoca submutica</i> var. <i>autumnalis</i>	Roundleaf broom heath			
<i>Muehlenbeckia axillaris</i>	Matted lignum		Add to RFA priority species list	Is a forest dwelling species
<i>Odixia achlaena</i>	Odixia			
<i>Olearia hookeri</i>	Hooker's daisy bush			
<i>Orthoceras strictum</i>	Horned orchid	Flora Recovery Plan: Tasmanian Threatened Orchids 2006-2010	Add to RFA priority species list	Is a forest dwelling species
<i>Ozothamnus lycopodioides</i>	Lycopoid everlasting			
<i>Ozothamnus reflexifolius</i>	Reflexed everlasting		Add to RFA priority species list	Is a forest dwelling species
<i>Ozothamnus selaginoides</i>	Clubmoss everlasting			
<i>Pandorea pandorana</i>	Wonga vine			
<i>Pellaea calidirupium</i>	Hot rock fern			
<i>Pentachondra ericifolia</i>	Matted carpet heath			
<i>Persicaria decipiens</i>	Slender knotweed			

Species	Common name	Prescription source	Recommendation	Basis for recommendation
<i>Persicaria subsessilis</i>	Bristly knotweed			
<i>Persoonia gunnii</i> var. <i>oblanceolata</i>	Gunn's geebung		Add to RFA priority species list	Is a forest dwelling species
<i>Persoonia muelleri</i> subsp. <i>angustifolia</i>	Mueller's geebung		Add to RFA priority species list	Previously included as <i>Persoonia muelleri</i> var. <i>angustifolia</i>
<i>Phebalium daviesii</i>	Davies' wax flower	Listing statement, <i>Phebalium daviesii</i> Recovery Plan 1996-2004		
<i>Ptherosphaera hookeriana</i>	Drooping pine		Add to RFA priority species list	Is a forest dwelling species
<i>Pimelea axiflora</i> subsp. <i>axiflora</i>	Bootlace bush			
<i>Pimelea curviflora</i> var. <i>gracilis</i>	Slender curved rice flower			
<i>Pimelea curviflora</i> var. <i>sericea</i>	Curved rice flower			
<i>Pimelea filiformis</i>	Trailing rice flower			
<i>Pimelea flava</i> subsp. <i>flava</i>	Yellow rice flower			
<i>Planocarpa nitida</i>	Shiny cheeseberry		Add to RFA priority species list	Is a forest dwelling species
<i>Plantago debilis</i>	Shade plantain			
<i>Plantago gaudichaudii</i>	Narrow plantain			
<i>Pneumatopteris pennigera</i>	Lime fern	Listing statement		
<i>Poa mollis</i>	Soft poa grass			
<i>Polyscias</i> aff. <i>sambucifolia</i>	Elderberry panax	Listing statement		
<i>Pomaderris elachophylla</i>	Small leaf pomaderris			
<i>Pomaderris intermedia</i>	Tree pomaderris			
<i>Pomaderris oraria</i> subsp. <i>oraria</i>	Coast pomaderris		Add to RFA priority species list	Previously included as <i>Pomaderris oraria</i>
<i>Pomaderris phyllicifolia</i> subsp. <i>phyllicifolia</i>	Narrow leaf pomaderris			
<i>Prasophyllum apoxychilum</i>	Tapered leek orchid	Listing statement, Flora Recovery Plan: Tasmanian Threatened Orchids 2006-2010		
<i>Prasophyllum incorrectum</i>	Golfer's leek-orchid	Listing statement, Flora Recovery Plan: Tasmanian Threatened Orchids 2006-2010	Add to RFA priority species list	Previously included as <i>Prasophyllum correctum</i>
<i>Prasophyllum milfordense</i>	Milford leek orchid	Listing statement, Flora Recovery Plan: Tasmanian Threatened Orchids 2006-2010		
<i>Prasophyllum montanum</i>	Mountain leek orchid	Listing statement, Flora Recovery Plan: Tasmanian Threatened Orchids 2006-2010		
<i>Prasophyllum perangustum</i>	Knocklofty leek orchid	Listing statement, Flora Recovery Plan: Tasmanian Threatened Orchids 2006-2010		
<i>Prasophyllum robustum</i>	Robust leek orchid	Listing statement, Flora Recovery Plan: Tasmanian Threatened Orchids 2006-2010		
<i>Prasophyllum stellatum</i>	Ben Lomond leek orchid	Listing statement, Flora Recovery Plan: Tasmanian Threatened Orchids 2006-2010		

Species	Common name	Prescription source	Recommendation	Basis for recommendation
<i>Prasophyllum tadgellianum</i>	Tadgell's leek orchid	Listing statement, Flora Recovery Plan: Tasmanian Threatened Orchids 2006-2010		
<i>Prostanthera rotundifolia</i>	Roundleaf mint bush			
<i>Pterostylis atriola</i>	Snug greenhood	Listing statement, Flora Recovery Plan: Tasmanian Threatened Orchids 2006-2010		
<i>Pterostylis commutata</i>	Midland greenhood	Listing statement, Flora Recovery Plan: Tasmanian Threatened Orchids 2006-2010		
<i>Pterostylis cycnocephala</i>	Swan greenhood	Listing statement, Flora Recovery Plan: Tasmanian Threatened Orchids 2006-2010		
<i>Pterostylis falcata</i>	Sickle greenhood	Flora Recovery Plan: Tasmanian Threatened Orchids 2006-2010		
<i>Pterostylis grandiflora</i>	Superb greenhood	Listing statement, Flora Recovery Plan: Tasmanian Threatened Orchids 2006-2010		
<i>Pterostylis sanguinea</i>	Banded greenhood	Flora Recovery Plan: Tasmanian Threatened Orchids 2006-2010		
<i>Pterostylis squamata</i>	Ruddy greenhood	Flora Recovery Plan: Tasmanian Threatened Orchids 2006-2010		
<i>Pterostylis tunstallii</i>	Tunstall's greenhood	Flora Recovery Plan: Tasmanian Threatened Orchids 2006-2010		
<i>Pultenaea humilis</i>	Dwarf bush pea			
<i>Pultenaea mollis</i>	Guinea flower bush pea		Add to RFA priority species list	Previously included as <i>Pultenaea hibbertioides</i>
<i>Pultenaea prostrata</i>	Prostrate bush pea			
<i>Ranunculus pumilio</i> var. <i>pumilio</i>	Ferny buttercup		Add to RFA priority species list	Previously included as <i>Ranunculus pumilio</i>
<i>Ranunculus sessiliflorus</i> var. <i>sessiliflorus</i>	Annual buttercup		Add to RFA priority species list	Previously included as <i>Ranunculus sessiliflorus</i>
<i>Rhytidosporum inconspicuum</i>	Alpine appleberry	Listing statement	Add to RFA priority species list	Is a forest dwelling species
<i>Scaevola aemula</i>	Fairy fanflower			
<i>Scleranthus brockiei</i>	Brock knawel		Add to RFA priority species list	Is a forest dwelling species
<i>Scleranthus diander</i>	Tufted knawel			
<i>Scleranthus fasciculatus</i>	Spreading knawel			
<i>Scutellaria humilis</i>	Dwarf scullcap			
<i>Senecio macrocarpus</i>	Fluffy groundsel			
<i>Senecio squarrosus</i>	Leafy groundsel			
<i>Senecio velleioides</i>	Forest groundsel			
<i>Siloxerus multiflorus</i>	Small wrinklewort		Add to RFA priority species list	Previously included as <i>Rutidosia multiflora</i>
<i>Solanum opacum</i>	Green berry nightshade		Add to RFA priority species list	Is a forest dwelling species
<i>Spyridium eriocephalum</i> var. <i>eriocephalum</i>	Heath spyridium	Listing statement	Add to RFA priority species list	Previously included as <i>Spyridium eriocephalum</i>

Species	Common name	Prescription source	Recommendation	Basis for recommendation
<i>Spyridium lawrencei</i>	Small leaf spyridium	Listing statement		
<i>Spyridium obcordatum</i>	Creeping spyridium	Listing statement		
<i>Spyridium parvifolium</i> var. <i>molle</i>	Soft furnace spyridium			
<i>Spyridium parvifolium</i> var. <i>parvifolium</i>	Australian dusty miller			
<i>Spyridium vexilliferum</i>	Winged spyridium			
<i>Stellaria multiflora</i>	Rayless starwort			
<i>Stenanthemum pimeleoides</i>	Spreading stenanthemum			
<i>Stenopetalum lineare</i>	Threadcross		Add to RFA priority species list	Is a forest dwelling species
<i>Stonesiella selaginoides</i>	Clubmoss bush pea		Add to RFA priority species list	Previously included as <i>Pultenaea selaginoides</i>
<i>Taraxacum cygnorum</i>	Coast dandelion		Add to RFA priority species list	Listed as Vulnerable on EPBCA 1999. Is a forest dwelling species
<i>Tetradthea ciliata</i>	Pink bells		Add to RFA priority species list	Is a forest dwelling species
<i>Tetradthea gunnii</i>	Shy susan	Listing statement, <i>Tetradthea gunnii</i> Recovery Plan 2001-2005		
<i>Teucrium corymbosum</i>	Forest germander			
<i>Thelymitra benthamiana</i>	Blotched sun orchid	Flora Recovery Plan: Tasmanian Threatened Orchids 2006-2010	Add to RFA priority species list	Is a forest dwelling species
<i>Thelymitra holmesii</i>	Holmes' sun orchid	Flora Recovery Plan: Tasmanian Threatened Orchids 2006-2010	Add to RFA priority species list	Is a forest dwelling species
<i>Thelymitra jonesii</i>	Sky-blue sun orchid	Listing statement, Flora Recovery Plan: Tasmanian Threatened Orchids 2006-2010	Add to RFA priority species list	Is a forest dwelling species
<i>Thelymitra malvina</i>	Mauve-tufted sun orchid	Listing statement, Flora Recovery Plan: Tasmanian Threatened Orchids 2006-2010	Add to RFA priority species list	Is a forest dwelling species
<i>Thelymitra mucida</i>	Plum orchid	Flora Recovery Plan: Tasmanian Threatened Orchids 2006-2010		
<i>Thismia rodwayi</i>	Fairy lanterns	Listing statement		
<i>Thryptomene micrantha</i>	Ribbed thryptomene	Listing statement		
<i>Thynniorchis huntiana</i>	Elbow orchid	Flora Recovery Plan: Tasmanian Threatened Orchids 2006-2010	Add to RFA priority species list	Previously included as <i>Arthrochilus huntianus</i> subsp. <i>huntianus</i>
<i>Thynniorchis nothofagicola</i>	Myrtle elbow orchid	Flora Recovery Plan: Tasmanian Threatened Orchids 2006-2010	Add to RFA priority species list	Previously included as <i>Arthrochilus huntianus</i> subsp. <i>nothofagicola</i>
<i>Tmesipteris parva</i>	Small fork fern	Listing statement		
<i>Tricoryne elatior</i>	Yellow rush lily			
<i>Uncinia elegans</i>	Handsome hook sedge			
<i>Velleia paradoxa</i>	Spur velleia			
<i>Veronica notabilis</i>	Forest speedwell			
<i>Veronica plebeia</i>	Trailing speedwell			
<i>Viminaria juncea</i>	Golden spray	Listing statement		
<i>Viola calejana</i>	Swamp violet			
<i>Viola cunninghamii</i>	Cunningham's violet			

<b>Species</b>	<b>Common name</b>	<b>Prescription source</b>	<b>Recommendation</b>	<b>Basis for recommendation</b>
<i>Viola hederacea</i> subsp. <i>curtisiae</i>	Curtis' violet		Add to RFA priority species list	Is a forest dwelling species
<i>Vittadinia cuneata</i> var. <i>cuneata</i>	Fuzzy New Holland daisy		Add to RFA priority species list	Previously included as <i>Vittadinia cuneata</i>
<i>Vittadinia gracilis</i>	Woolly New Holland daisy			
<i>Vittadinia megacephala</i>	Giant New Holland daisy			
<i>Vittadinia muelleri</i>	Narrow leaf New Holland daisy			
<i>Westringia angustifolia</i>	Scabrous westringia			
<i>Westringia brevifolia</i> var. <i>raleighii</i>	Native rosemary			
<i>Xanthorrhoea arenaria</i>	Sand grass tree	Flora Recovery Plan: Threatened Tasmanian Grasstrees 2006-2010	Add to RFA priority species list	Is a forest dwelling species
<i>Xanthorrhoea bracteata</i>	Shiny grass tree	Flora Recovery Plan: Threatened Tasmanian Grasstrees 2006-2010		
<i>Xerochrysum bicolor</i>	White alpine everlasting		Add to RFA priority species list	Is a forest dwelling species
<i>Xerochrysum palustre</i>	Swamp everlasting		Add to RFA priority species list	Listed as Vulnerable on EPBCA 1999. Is a forest dwelling species
<i>Zieria littoralis</i>	Dwarf zieria		Add to RFA priority species list	Previously included as <i>Zieria cytisoides</i>
<i>Zieria veronicea</i> subsp. <i>veronicea</i>	Pink zieria		Add to RFA priority species list	Previously included as <i>Zieria veronicea</i>

**Table 1.2.b (ii) Non-vascular Flora Species**

<b>Species</b>	<b>Common name</b>	<b>Prescription source</b>	<b>Recommendation</b>	<b>Basis for recommendation</b>
<i>Bunodophoron notatum</i>	Lichen		Add to RFA priority species list	Is a forest dwelling species
<i>Calycidium cuneatum</i>	Lichen		Add to RFA priority species list	Is a forest dwelling species
<i>Calycidium polycarpum</i>	Lichen		Add to RFA priority species list	Is a forest dwelling species
<i>Erioderma solediatum</i>	Lichen		Add to RFA priority species list	Is a forest dwelling species
<i>Hypotrachyna immaculata</i>	Lichen		Add to RFA priority species list	Is a forest dwelling species
<i>Hypotrachyna laevigata</i>	Lichen		Add to RFA priority species list	Is a forest dwelling species
<i>Melanelia piliferella</i>	Lichen		Add to RFA priority species list	Is a forest dwelling species
<i>Menegazzia minuta</i>	Lichen		Add to RFA priority species list	Is a forest dwelling species
<i>Neofuscelia graniticola</i>	Lichen		Add to RFA priority species list	Is a forest dwelling species
<i>Neofuscelia subloxodella</i>	Lichen		Add to RFA priority species list	Is a forest dwelling species
<i>Parmelina pallida</i>	Lichen		Add to RFA priority species list	Is a forest dwelling species
<i>Parmeliopsis ambigua</i>	Lichen		Add to RFA priority species list	Is a forest dwelling species
<i>Parmeliopsis hyperopta</i>	Lichen		Add to RFA priority species list	Is a forest dwelling species
<i>Parmotrema crinitum</i>	Lichen		Add to RFA priority species list	Is a forest dwelling species
<i>Punctelia subflava</i>	Lichen		Add to RFA priority species list	Is a forest dwelling species
<i>Roccellinastrum neglectum</i>	Lichen		Add to RFA priority species list	Is a forest dwelling species
<i>Xanthoparmelia jarmaniae</i>	Lichen		Add to RFA priority species list	Is a forest dwelling species
<i>Xanthoparmelia mannumensis</i>	Lichen		Add to RFA priority species list	Is a forest dwelling species
<i>Xanthoparmelia molliuscula</i>	Lichen		Add to RFA priority species list	Is a forest dwelling species
<i>Xanthoparmelia oleosa</i>	Lichen		Add to RFA priority species list	Is a forest dwelling species
<i>Xanthoparmelia vicaria</i>	Lichen		Add to RFA priority species list	Is a forest dwelling species
<i>Xanthoparmelia vicariella</i>	Lichen		Add to RFA priority species list	Is a forest dwelling species

**Table 1.2.b(iii) Proposed RFA priority flora species not listed under TPS Act or EPBC Act**

Species	Common name	Prescription source	Recommendation	Basis for recommendation
<i>Arthropodium minus</i>	Small vanilla-lily		Retain on RFA priority species list	Further research required
<i>Asplenium trichomanes</i> subsp. <i>trichomanes</i>	Dolerite spleenwort		Retain on RFA priority species list	Proposed for nomination as endangered under TSPA
<i>Austrostipa scabra</i> subsp. <i>falcata</i>	Rough speargrass		Add to RFA priority species list	Protected as part of TSPA listed <i>Austrostipa scabra</i> . Research required.
<i>Austrostipa scabra</i> subsp. <i>scabra</i>	Sickle speargrass		Add to RFA priority species list	Protected as part of TSPA listed <i>Austrostipa scabra</i> . Research required.
<i>Calystegia marginata</i>	Forest bindweed		Add to RFA priority species list	Nominated for listing as endangered
<i>Carex bichenoviana</i>	Plains sedge		Retain on RFA priority species list	Further research required
<i>Desmodium varians</i>	Slender ticktrefoil		Add to RFA priority species list	Protected as part of TSPA listed <i>Desmodium gunnii</i> (broad sense). Research required.
<i>Epacris exserta</i> (narrow sense)	South Esk heath		Add to RFA priority species list	Protected as part of TSPA listed <i>Epacris exserta</i> (broad sense). Research required.
<i>Epacris franklinii</i>	Western riverheath		Add to RFA priority species list	Near threatened though not listed
<i>Epacris marginata</i>	Rigid heath		Retain on RFA priority species list	Further research required
<i>Epacris mucronulata</i>	Southern riverheath			Near threatened though not listed
<i>Epacris</i> sp. Puzzler Gorge	Puzzler Gorge heath		Add to RFA priority species list	Protected as part of TSPA listed <i>Epacris exserta</i> (broad sense). Research required.
<i>Epacris virgata</i> (Kettering)	Pretty heath		Retain on RFA priority species list	Further research required
<i>Epacris virgata</i> (Beaconsfield)	Pretty heath		Retain on RFA priority species list	Further research required
<i>Eucalyptus archeri</i>	Alpine cider gum		Retain on RFA priority species list	Further research required
<i>Eucalyptus cordata</i>	Tasmanian silver gum		Retain on RFA priority species list	Further research required
<i>Euphrasia</i> aff. <i>diemenica</i>	Middle eyebright		Add to RFA priority species list	Included in Lowland <i>Euphrasia</i> Recovery Plan. Research and protection required.
<i>Festuca plebeia</i>	Tasmanian fescue		Retain on RFA priority species list	Further research required
<i>Grevillea australis</i> var. <i>tenuifolia</i>	Slender grevillea		Retain on RFA priority species list	Further research required
<i>Hypoxis vaginata</i> var. <i>brevistigmata</i>	Sheathing yellowstar		Add to RFA priority species list	Protected as part of TSPA listed <i>Hypoxis vaginata</i> . Research required.
<i>Hypoxis vaginata</i> var. <i>vaginata</i>	Sheathing yellowstar		Add to RFA priority species list	Protected as part of TSPA listed <i>Hypoxis vaginata</i> . Research required.
<i>Pimelea curviflora</i>	Curved riceflower		Add to RFA priority species list	The 2 listed subspecies aren't recognised as taxonomic entities. Research required.
<i>Rytidosperma nitens</i>	Shiny wallabygrass		Retain on RFA priority species list	Further research required
<i>Vittadinia burbridgeae</i>	Smooth new-holland-daisy		Add to RFA priority species list	Protected as part of TSPA listed <i>Vittadinia cuneata</i> var. <i>cuneata</i> in the broad sense - Research required.
<i>Xanthorrhoea australis</i>	Sand grasstree		Add to RFA priority species list	Further research required (due to presence of intergrades with listed <i>Xanthorrhoea</i> sp.)

**Table 1.2.b (iv) Flora species recommended for removal from Priority Species list**

Species	Common name	Prescription source	Recommendation	Basis for recommendation
<i>Acacia mucronata</i> var. <i>dependens</i>			Remove from RFA priority species list	Now listed on TSPA 1995 as <i>Acacia mucronata</i> subsp. <i>dependens</i>
<i>Agrostis aemula</i> var. <i>aemula</i>	Tumbling blowgrass		Remove from RFA priority species list	Delisted from TSPA 1995. Now <i>Lachnagrostis aemula</i> .
<i>Agrostis aemula</i> var. <i>setifolia</i>			Remove from RFA priority species list	Now listed on TSPA 1995 as <i>Lachnagrostis punicea</i> subsp. <i>punicea</i>
<i>Agrostis</i> aff. <i>australiensis</i>			Remove from RFA priority species list	Now listed on TSPA 1995 as <i>Agrostis diemenica</i>
<i>Aristida benthamii</i>			Remove from RFA priority species list	Now listed on TSPA 1995 as <i>Aristida benthamii</i> var. <i>benthamii</i>
<i>Arthrochilus huntianus</i> subsp. <i>huntianus</i>			Remove from RFA priority species list	Now listed on TSPA 1995 as <i>Thynninorchis huntiana</i>
<i>Arthrochilus huntianus</i> subsp. <i>nothofagicola</i>			Remove from RFA priority species list	Now listed on TSPA 1995 as <i>Thynninorchis nothofagicola</i>
<i>Austrodanthonia popinensis</i>	Roadside wallaby grass		Remove from RFA priority species list	Not a forest dwelling species
<i>Austrodanthonia remota</i>	Remote wallaby grass		Remove from RFA priority species list	Not a forest dwelling species
<i>Baumea articulata</i>	Jointed twig rush		Remove from RFA priority species list	Not a forest dwelling species
<i>Bertya rosmarinifolia</i>			Remove from RFA priority species list	Now listed on TSPA 1995 as <i>Bertya tasmanica</i> subsp. <i>tasmanica</i>
<i>Bolboschoenus medianus</i>	Marsh club-rush		Remove from RFA priority species list	Not a forest dwelling species
<i>Boronia rhomboidea</i>	Broadleaf boronia		Remove from RFA priority species list	Did not qualify as a listed species when assessed against TSP Act 1995 criteria
<i>Brachyscome tenuiscapa</i> var. <i>pubescens</i>	-		Remove from RFA priority species list	Delisted from TSPA 1995
<i>Caladenia filamentosa</i> var. <i>filamentosa</i>			Remove from RFA priority species list	Now listed on TSPA 1995 as <i>Caladenia filamentosa</i>
<i>Calandrinia granulifera</i>	Grainy purslane		Remove from RFA priority species list	Not a forest dwelling species
<i>Callitris</i> aff. <i>oblonga</i>			Remove from RFA priority species list	Now listed on TSPA 1995 as <i>Callitris oblonga</i> subsp. <i>oblonga</i>
<i>Calocephalus citreus</i>	Lemon beauty heads		Remove from RFA priority species list	Not a forest dwelling species
<i>Calocephalus lacteus</i>	Milky beauty heads		Remove from RFA priority species list	Not a forest dwelling species
<i>Chamaesyce drummondii</i>	Caustic spurge		Remove from RFA priority species list	Delisted from TSPA 1995
<i>Cotula vulgaris</i> var. <i>australasica</i>	Slender cotula		Remove from RFA priority species list	Not a forest dwelling species
<i>Cynoglossum latifolium</i>			Remove from RFA priority species list	Now listed on TSPA 1995 as <i>Austrocynoglossum latifolium</i>
<i>Deyeuxia lawrencei</i>	Lawrence's bent grass		Remove from RFA priority species list	Not a forest dwelling species
<i>Dichopogon strictus</i>			Remove from RFA priority species list	Now listed on TSPA 1995 as <i>Arthropodium strictum</i>
<i>Epacris</i> aff. <i>exerta</i> Union Bridge	Union Bridge heath		Remove from RFA priority species list	Delisted from TSPA 1995. Now part of <i>Epacris franklinii</i> .
<i>Epacris graniticola</i>			Remove from RFA priority species list	Now listed on TSPA 1995 as <i>Epacris</i> aff. <i>virgata</i> 'graniticola'
<i>Euphrasia collina</i> subsp. <i>tetragona</i>	North Coast eyebright		Remove from RFA priority species list	Not a forest dwelling species

Species	Common name	Prescription source	Recommendation	Basis for recommendation
<i>Gahnia rodwayi</i>	Dwarf sawsedge		Remove from RFA priority species list	Delisted from TSPA 1995
<i>Genoplesium nudum</i>			Remove from RFA priority species list	Now listed on TSPA 1995 as <i>Corunastylis nuda</i>
<i>Goodenia amplexans</i>	-		Remove from RFA priority species list	Delisted from TSPA 1995
<i>Goodenia barbata</i>			Remove from RFA priority species list	Now listed on TSPA 1995 as <i>Coopernookia barbata</i>
<i>Hibbertia obtusifolia</i>	Hoary guinea flower		Remove from RFA priority species list	Not a forest dwelling species
<i>Hibbertia rufa</i>	Brown guinea flower		Remove from RFA priority species list	Not a forest dwelling species
<i>Isolepis setacea</i>	Bristle clubsedge		Remove from RFA priority species list	Delisted from TSPA 1995
<i>Leptorhynchos elongatus</i>	Lanky buttons		Remove from RFA priority species list	Not a forest dwelling species
<i>Leucopogon lanceolatus</i>			Remove from RFA priority species list	Now listed on TSPA 1995 as <i>Leucopogon lanceolatus</i> var. <i>lanceolatus</i>
<i>Millotia muelleri</i>	Common bow flower		Remove from RFA priority species list	Not a forest dwelling species
<i>Millotia tenuifolia</i>	Soft bowflower		Remove from RFA priority species list	Delisted from TSPA 1995. Now <i>Millotia tenuifolia</i> var. <i>tenuifolia</i> .
<i>Persoonia muelleri</i> var. <i>angustifolia</i>			Remove from RFA priority species list	Now listed on TSPA 1995 as <i>Persoonia muelleri</i> subsp. <i>angustifolia</i>
<i>Phyllangium distylis</i>	Tiny mitrewort		Remove from RFA priority species list	Not a forest dwelling species
<i>Phyllangium divergens</i>	Wiry mitrewort		Remove from RFA priority species list	Not a forest dwelling species
<i>Pilularia novae-hollandiae</i>	Austral pillwort		Remove from RFA priority species list	Not a forest dwelling species
<i>Pimelea pauciflora</i>	Poison riceflower		Remove from RFA priority species list	Delisted from TSPA 1995
<i>Podotheca angustifolia</i>	Sticky longheads		Remove from RFA priority species list	Not a forest dwelling species
<i>Pomaderris oraria</i>			Remove from RFA priority species list	Now listed on TSPA 1995 as <i>Pomaderris oraria</i> subsp. <i>oraria</i>
<i>Pomaderris paniculosa</i> subsp. <i>paralia</i>	Shining pomaderris		Remove from RFA priority species list	Not a forest dwelling species
<i>Prasophyllum correctum</i>			Remove from RFA priority species list	Not a forest dwelling species. Now listed on TSPA 1995 as <i>Prasophyllum incorrectum</i> ,
<i>Prostanthera cuneata</i>	Alpine mint bush		Remove from RFA priority species list	Not a forest dwelling species
<i>Pultenaea hibbertioides</i>			Remove from RFA priority species list	Now listed on TSPA 1995 as <i>Pultenaea mollis</i>
<i>Pultenaea selaginoides</i>			Remove from RFA priority species list	Now listed on TSPA 1995 as <i>Stonesiella selaginoides</i>
<i>Ranunculus pumilio</i>			Remove from RFA priority species list	Now listed on TSPA 1995 as <i>Ranunculus pumilio</i> var. <i>pumilio</i>
<i>Ranunculus sessiliflorus</i>			Remove from RFA priority species list	Now listed on TSPA 1995 as <i>Ranunculus sessiliflorus</i> var. <i>sessiliflorus</i>
<i>Rhodanthe anthemoides</i>	Chamomile sunray		Remove from RFA priority species list	Not a forest dwelling species
<i>Rutidosia multiflora</i>			Remove from RFA priority species list	Now listed on TSPA 1995 as <i>Siloxerus multiflorus</i>
<i>Rytidosperma procerum</i>			Remove from RFA priority species list	Now listed on TSPA 1995 as <i>Austrodanthonia induta</i>
<i>Schoenoplectus validus</i>	River club sedge		Remove from RFA priority species list	Not a forest dwelling species

<b>Species</b>	<b>Common name</b>	<b>Prescription source</b>	<b>Recommendation</b>	<b>Basis for recommendation</b>
<i>Schoenus latelaminatus</i>	Medusa bog sedge		Remove from RFA priority species list	Not a forest dwelling species
<i>Spyridium eriocephalum</i>			Remove from RFA priority species list	Now listed on TSPA 1995 as <i>Spyridium eriocephalum</i> var. <i>eriocephalum</i>
<i>Stackhousia gunnii</i>	Gunn's mignonette		Remove from RFA priority species list	Not a forest dwelling species
<i>Stackhousia viminea</i>	Slender stackhousia		Remove from RFA priority species list	Not a forest dwelling species
<i>Taraxacum aristum</i>	Austral dandelion		Remove from RFA priority species list	Not a forest dwelling species
<i>Thesium australe</i>	Austral toadflax		Remove from RFA priority species list	Not a forest dwelling species
<i>Triptilodiscus pygmaeus</i>	Common sunray		Remove from RFA priority species list	Not a forest dwelling species
<i>Veronica novae-hollandiae</i>	New Holland speedwell		Remove from RFA priority species list	Not a forest dwelling species
<i>Vittadinia cuneata</i>			Remove from RFA priority species list	Now listed on TSPA 1995 as <i>Vittadinia cuneata</i> var. <i>cuneata</i> as per the 2002 census, includes the newly described <i>Vittadinia burbridgeae</i>
<i>Wurmbea latifolia</i>	Early nancy		Remove from RFA priority species list	Not a forest dwelling species
<i>Zieria cytisoides</i>			Remove from RFA priority species list	Now listed on TSPA 1995 as <i>Zieria littoralis</i>
<i>Zieria veronicea</i>			Remove from RFA priority species list	Now listed on TSPA 1995 as <i>Zieria veronicea</i> subsp. <i>veronicea</i>

**Table 1.2.b (v) Proposed Priority Fauna Species**

Species	Common name	Prescription source	Basis for recommendation	Recommendation
<b>FAUNA</b>				
<i>Acanthiza pusilla archibaldi</i>	Brown thornbill (King Island)		Listed TSPA 2002	Add to RFA priority species list
<i>Acanthornis magnus greenianus</i>	Scrubtit (King Island)		Listed TSPA 2002	Add to RFA priority species list
<i>Accipiter novaehollandiae</i>	Grey goshawk	Threatened Fauna Adviser		
<i>Alcedo azurea diemensis</i>	Azure kingfisher		Omitted from Appendix 1.2b 2002 but included in RFA priority species list, and Listed TSPA 2004	Move to listed species category/
<i>Antipodia chaostola</i>	Chaostola skipper	Threatened Fauna Adviser		
<i>Aquila audax</i>	Wedge-tailed eagle	Recovery Plan/Threatened Fauna Adviser		
<i>Astacopsis gouldi</i>	Giant Freshwater Crayfish	Recovery Plan/Threatened Fauna Adviser		
<i>Austrochloritis victoriae</i>	Southern hairy red snail	Threatened Fauna Adviser		
<i>Beddomeia angulata</i>	Hydrobiid Snail (Rabid River)	Threatened Fauna Adviser		
<i>Beddomeia averni</i>	Hydrobiid Snail (West Gawler)	Threatened Fauna Adviser		
<i>Beddomeia bellii</i>	Hydrobiid Snail (Heazlewood River)	Threatened Fauna Adviser		
<i>Beddomeia bowryensis</i>	Hydrobiid Snail (Bowry Creek)	Threatened Fauna Adviser		
<i>Beddomeia briansmithi</i>	Hydrobiid Snail (Fern Creek)	Threatened Fauna Adviser		
<i>Beddomeia camensis</i>	Hydrobiid Snail (Cam River)	Threatened Fauna Adviser		
<i>Beddomeia capensis</i>	Hydrobiid Snail (Table Cape)	Threatened Fauna Adviser		
<i>Beddomeia fallax</i>	Hydrobiid Snail (Heathcote Creek)	Threatened Fauna Adviser		
<i>Beddomeia forthensis</i>	Hydrobiid Snail (Wilmot River)	Threatened Fauna Adviser		
<i>Beddomeia franklandensis</i>	Hydrobiid Snail (Frankland River )	Threatened Fauna Adviser		
<i>Beddomeia fromensis</i>	Hydrobiid Snail (Frome River)	Threatened Fauna Adviser		
<i>Beddomeia fultoni</i>	Hydrobiid Snail (Farnhams Creek)	Threatened Fauna Adviser		
<i>Beddomeia gibba</i>	Hydrobiid Snail (Salmon River Road)	Threatened Fauna Adviser		
<i>Beddomeia hallae</i>	Hydrobiid Snail (Buttons Rivulet)	Threatened Fauna Adviser		
<i>Beddomeia hermansi</i>	Hydrobiid Snail (Viking Creek)	Threatened Fauna Adviser		
<i>Beddomeia hullii</i>	Hydrobiid Snail (Heazlewood River)	Threatened Fauna Adviser		
<i>Beddomeia inflata</i>	Hydrobiid Snail (Heathcote Creek)	Threatened Fauna Adviser		
<i>Beddomeia kershawi</i>	Hydrobiid Snail (Macquarie River)	Threatened Fauna Adviser		
<i>Beddomeia kessneri</i>	Hydrobiid Snail (Dip Falls)	Threatened Fauna Adviser		
<i>Beddomeia krybetes</i>	Hydrobiid Snail (Great Lake)	Threatened Fauna Adviser		
<i>Beddomeia launcestonensis</i>	Hydrobiid Snail (Cataract Gorge)	Threatened Fauna Adviser		
<i>Beddomeia lodderae</i>	Hydrobiid Snail (Upper Castra Rivulet)	Threatened Fauna Adviser		
<i>Beddomeia mesibovi</i>	Hydrobiid Snail (Arthur River)	Threatened Fauna Adviser		
<i>Beddomeia minima</i>	Hydrobiid Snail (Scottsdale)	Threatened Fauna Adviser		

Species	Common name	Prescription source	Basis for recommendation	Recommendation
<i>Beddomeia petterdi</i>	Hydrobiid Snail (Blyth River)	Threatened Fauna Adviser		
<i>Beddomeia phasianella</i>	Hydrobiid Snail (Keddies Creek)	Threatened Fauna Adviser		
<i>Beddomeia protuberata</i>	Hydrobiid Snail (Emu River)	Threatened Fauna Adviser		
<i>Beddomeia ronaldi</i>	Hydrobiid Snail (St. Patricks River)	Threatened Fauna Adviser		
<i>Beddomeia salmonis</i>	Hydrobiid Snail (Salmon River)	Threatened Fauna Adviser		
<i>Beddomeia tasmanica</i>	Hydrobiid Snail (Terrys Creek)	Threatened Fauna Adviser		
<i>Beddomeia topsiae</i>	Hydrobiid Snail (Williamson Creek)	Threatened Fauna Adviser		
<i>Beddomeia trochiformis</i>	Hydrobiid Snail (Bowry Creek)	Threatened Fauna Adviser		
<i>Beddomeia tumida</i>	Hydrobiid Snail (St. Pauls River)	Threatened Fauna Adviser		
<i>Beddomeia turnerae</i>	Hydrobiid Snail (Minnow River)	Threatened Fauna Adviser		
<i>Beddomeia waterhouseae</i>	Hydrobiid Snail (Clayton's Rivulet)	Threatened Fauna Adviser		
<i>Beddomeia wilmotensis</i>	Hydrobiid Snail (Wilmot river)	Threatened Fauna Adviser		
<i>Beddomeia wiseae</i>	Hydrobiid Snail (Blizzards Creek)	Threatened Fauna Adviser		
<i>Beddomeia zeehanensis</i>	Hydrobiid Snail (Little Henty River)	Threatened Fauna Adviser		
<i>Castiarina insculpta</i>	Miena jewel beetle		Presumed extinct and rediscovered 2004/Forest dwelling species	Add to RFA priority species list
<i>Catadromus lacordairei</i>	Catadromus carabid beetle	Threatened Fauna Adviser		
<i>Charopidae "Skemps"</i>	"Skemps" snail	Threatened Fauna Adviser		
<i>Dasyurus maculatus maculatus</i>	Spotted tailed quoll	Threatened Fauna Adviser		
<i>"Discocharopa" vigena</i>	Land Snail		Listed TSPA 2002	Add to RFA priority species list
<i>Diplectrona lyella</i>	Caddisfly	Listing Statement/Threatened Fauna Adviser		
<i>Enchymus sp. nov.</i>	Weldborough forest weevil		Listed TSPA 2002	Add to RFA priority species list
<i>Ecnomina vega</i>	Caddisfly	Listing Statement/Threatened Fauna Adviser		
<i>Engaeus granulatus</i>	Central north burrowing crayfish		Listed TSPA 2005	Add to RFA priority species list
<i>Engaeus martigener</i>	Furneaux burrowing crayfish		Listed TSPA 2002	Add to RFA priority species list
<i>Engaeus orramakunna</i>	Mt. Arthur Burrowing Crayfish	Recovery Plan/Threatened Fauna Adviser		
<i>Engaeus spinicaudatus</i>	Scottsdale Burrowing Crayfish	Recovery Plan/Threatened Fauna Adviser		
<i>Engaeus yabbimunna</i>	Burrowing Crayfish (Burnie)	Recovery Plan/Threatened Fauna Adviser		
<i>Fraus latistria</i>	Broad-striped ghost moth	Threatened Fauna Adviser		
<i>Galaxias auratus</i>	Golden galaxias	Recovery Plan/Threatened Fauna Adviser		
<i>Galaxias fontanus</i>	Swan galaxias	Recovery Plan/Threatened Fauna Adviser		
<i>Galaxias johnstoni</i>	Clarence galaxias	Recovery Plan/Threatened Fauna Adviser		
<i>Galaxias parvus</i>	Swamp galaxias	Recovery Plan/Threatened Fauna Adviser		
<i>Galaxias tanycephalus</i>	Saddled galaxias	Recovery Plan/Threatened Fauna Adviser		
<i>Galaxiella pusilla</i>	Dwarf galaxias	Recovery Plan/Recovery Plan/Threatened Fauna Adviser		
<i>Glacidorbis pawpela</i>	Hydrobiid Snail (Great Lake)	Threatened Fauna Adviser		
<i>Goedetrechus mendumae</i>	Cave Beetle (Ida Bay)	Listing Statement/Threatened Fauna Adviser		

Species	Common name	Prescription source	Basis for recommendation	Recommendation
<i>Goedtrechus parallelus</i>	Cave Beetle (Junee-Florentine)	Threatened Fauna Adviser		
<i>Haliaeetus leucogaster</i>	White-bellied sea-eagle	Recovery Plan/Threatened Fauna Adviser	Listed TSPA 2004	Move to listed species category
<i>Helicarion rubicundus</i>	Burgundy snail	Threatened Fauna Adviser		
<i>Hickmanoxyomma cavaticum</i>	Cave Harvestman	Listing Statement/Threatened Fauna Adviser		
<i>Hickmanoxyomma gibbergunyar</i>	Cave Harvestman	Listing Statement/Threatened Fauna Adviser		
<i>Hoplogonus bornemisszai</i>	Bornemisszas stag beetle	Threatened Fauna Adviser		
<i>Hoplogonus simsoni</i>	Simsons stag beetle	Threatened Fauna Adviser		
<i>Hoplogonus vanderschoori</i>	Vanderschoors stag beetle	Threatened Fauna Adviser		
<i>Hydrobiosella armata</i>	Caddisfly	Listing Statement/Threatened Fauna Adviser		
<i>Hydrobiosella sagitta</i>	Caddisfly	Listing Statement/Threatened Fauna Adviser		
<i>Hydroptila scamandra</i>	Caddisfly	Listing Statement/Threatened Fauna Adviser		
<i>Idacarus cordicollis</i>	Cave Beetle (Hastings Cave)	Threatened Fauna Adviser		
<i>Idacarus troglodytes</i>	Cave Beetle (Precipitous Bluff)	Listing Statement/Threatened Fauna Adviser		
<i>Lathamus discolor</i>	Swift parrot	Recovery Plan/Threatened Fauna Adviser		
<i>Leptocerus souta</i>	Caddisfly	Listing Statement/Threatened Fauna Adviser		
<i>Limnodynastes peroni</i>	Perons marsh frog	Threatened Fauna Adviser	Omitted from Appendix 1.2b 2002 but included in RFA priority species list, and Listed TSPA 2002	Move to listed species category
<i>Lissotes latidens</i>	Broad-toothed stag beetle	Threatened Fauna Adviser		
<i>Lissotes menalcas</i>	Mt Mangana stag beetle	Threatened Fauna Adviser		
<i>Litoria raniformis</i>	Green and gold frog	Listing Statement/Threatened Fauna Adviser		
<i>Mesacanthotelson setosus</i>	Isopod (Great Lake)	Listing Statement/Threatened Fauna Adviser		
<i>Mesacanthotelson tasmaniae</i>	Isopod (Great Lake)	Listing Statement/Threatened Fauna Adviser		
<i>Micropathus kiernani</i>	Cave Cricket	Threatened Fauna Adviser		
<i>Migas plumleyi</i>	Spider (Cataract Gorge)			
<i>Miselaoma weldi</i>	Stanley Snail			
<i>Neophema chrysogaster</i>	Orange-bellied parrot	Recovery Plan	Forest dwelling species	Add to RFA priority species list
<i>Oecetis gilva</i>	Caddisfly	Listing Statement/Threatened Fauna Adviser		
<i>Olgania excavata</i>	Cave Spider (Bubs Hill Cave)	Threatened Fauna Adviser		
<i>Onchotelson brevicaudatus</i>	Isopod (Great Lake & Shannon Lagoon)	Listing Statement/Threatened Fauna Adviser		
<i>Onchotelson spatulatus</i>	Isopod (Great Lake)	Listing Statement/Threatened Fauna Adviser		
<i>Ooperipatellus cryptus</i>	Northwest velvet worm	Threatened Fauna Adviser		
<i>Oreisplanus munionga larana</i>	Marawah skipper		Listed TSPA 2002	Add to RFA priority species list
<i>Oreixenica ptunarra</i>	Ptunarra brown butterfly	Listing Statement/Threatened Fauna Adviser		
<i>Orphninostrichia maculata</i>	Caddisfly	Listing Statement/Threatened Fauna Adviser		
<i>Orthotrichia adornata</i>	Caddisfly	Listing Statement/Threatened Fauna Adviser		
<i>Oxyethira mienica</i>	Caddisfly	Listing Statement/Threatened Fauna Adviser		

Species	Common name	Prescription source	Basis for recommendation	Recommendation
<i>Paragalaxias dissimilis</i>	Shannon paragalaxias	Recovery Plan/Threatened Fauna Adviser		
<i>Paragalaxias eleotroides</i>	Great Lake paragalaxias	Recovery Plan/Threatened Fauna Adviser		
<i>Paragalaxias mesotes</i>	Arthurs paragalaxias	Recovery Plan/Threatened Fauna Adviser		
<i>Pardalotus quadragintus</i>	Forty-spotted pardalote	Recovery Plan/Threatened Fauna Adviser		
<i>Pasmaditta jungermanniae</i>	"Cataract Gorge" snail	Threatened Fauna Adviser		
<i>Perameles gunni</i>	Eastern barred bandicoot	Threatened Fauna Adviser		
<i>Phrantela annamurrayae</i>	Hydrobiid Snail (Heazlewood River)	Threatened Fauna Adviser		
<i>Phrantela conica</i>	Hydrobiid Snail (Little Henty River)	Threatened Fauna Adviser		
<i>Phrantela marginata</i>	Hydrobiid Snail (Heazlewood River)	Threatened Fauna Adviser		
<i>Phrantela pupiformis</i>	Hydrobiid Snail (Tyenna River)	Threatened Fauna Adviser		
<i>Platycercus caledonicus brownii</i>	King Island green rosella		Listed TSPA 2002	Add to RFA priority species list
<i>Prototroctes maraena</i>	Australian grayling	Threatened Fauna Adviser		
<i>Pseudalmenus chlorinda myrsilus</i>	Tasmanian hairstreak butterfly		Listed TSPA 2002	Add to RFA priority species list
<i>Pseudemoia pagenstecheri</i>	Tussock skink		Listed TSPA 2002	Add to RFA priority species list
<i>Pseudemoia rawlinsoni</i>	Glossy grass skink		Listed TSPA 2002	Add to RFA priority species list
<i>Pseudomys novaehollandiae</i>	New Holland mouse	Threatened Fauna Adviser		
<i>Pseudotyranochthonius typhlus</i>	Cave Pseudoscorpion (Mole Creek)	Listing Statement/Threatened Fauna Adviser		
<i>Ramiheithrus kocinus</i>	Caddisfly	Listing Statement/Threatened Fauna Adviser		
<i>Roblinella agnewi</i>	Silky Snail			
<i>Sarcophilus harrisii</i>	Tasmanian devil		Listed TSPA 2006	Add to RFA priority species list
<i>Schayera baiulus</i>	Schayers grasshopper	Listing Statement/Threatened Fauna Adviser		
<i>Stenopsychodes lineata</i>	Caddisfly	Listing Statement/Threatened Fauna Adviser		
<i>Tasimia drepana</i>	Caddisfly	Listing Statement/Threatened Fauna Adviser		
<i>Tasmanipatus anophthalmus</i>	Blind velvet worm	Listing Statement/Threatened Fauna Adviser		
<i>Tasmanipatus barretti</i>	Giant velvet worm	Listing Statement/Threatened Fauna Adviser		
<i>Tasmanotrechus cockerilli</i>	Cave Beetle (Mole Creek)	Listing Statement/Threatened Fauna Adviser		
<i>Tasmaphena lamproides</i>	Keeled snail	Threatened Fauna Adviser		
<i>Tasniphargus tyleri</i>	Amphipod (Great Lake)	Listing Statement/Threatened Fauna Adviser		
<i>Tyto novaehollandiae castanops</i>	Tasmanian masked owl	Forest Practices Code	Listed TSPA 2002	Add to RFA priority species list
<i>Uramphisopus pearsoni</i>	Isopod (Great Lake)	Listing Statement/Threatened Fauna Adviser		

---

**SPECIES NOT LISTED UNDER LEGISLATION**


---

**FAUNA**


---

<i>Accipiter cirrocephalus</i>	Collared sparrowhawk		Omitted from Appendix 1.2b 2002 but included in RFA priority species list	Reinstate on RFA priority species list
<i>Archipetalia auriculata</i>	Alpine dragonfly		Omitted from Appendix 1.2b 2002 but included in RFA priority species list	Reinstate on RFA priority species list
<i>Bettongia gaimardi</i>	Tasmanian bettong	Threatened Fauna Adviser		
<i>Cryptops n. sp.</i>	undescribed centipede		Omitted from Appendix 1.2b 2002 but included in RFA priority species list	Reinstate on RFA priority species list
<i>Dasyurus viverrinus</i>	Eastern quoll	Threatened Fauna Adviser		
<i>Lackrano carbo</i>	Geometrid moth		Omitted from Appendix 1.2b 2002 but included in RFA priority species list	Reinstate on RFA priority species list
<i>Myiagra cyanoleuca</i>	Satin flycatcher		Omitted from Appendix 1.2b 2002 but included in RFA priority species list	Reinstate on RFA priority species list
<i>Neiboissoperla n. sp.</i>	Stonefly		Omitted from Appendix 1.2b 2002 but included in RFA priority species list	Reinstate on RFA priority species list
<i>Neopseudogarypus scutellatus</i>	Pseudoscorpion		Omitted from Appendix 1.2b 2002 but included in RFA priority species list	Reinstate on RFA priority species list
<i>Nicteria macrocosma</i>	Geometrid moth		Omitted from Appendix 1.2b 2002 but included in RFA priority species list	Reinstate on RFA priority species list
<i>Paralamyctes n. sp.</i>	undescribed centipede		Omitted from Appendix 1.2b 2002 but included in RFA priority species list	Reinstate on RFA priority species list
<i>Reikoperla n. sp.</i>	Stonefly		Omitted from Appendix 1.2b 2002 but included in RFA priority species list	Reinstate on RFA priority species list
<i>Tasmanophilus n. sp.</i>	undescribed centipede		Omitted from Appendix 1.2b 2002 but included in RFA priority species list	Reinstate on RFA priority species list

Hollow dependant species

Forest Practices Code

Karst species

Forest Practices Code

---

## APPENDIX 1.2.b.2 Forest dwelling flora and fauna species with a change in listing status under Threatened Species Protection Act 1995 since 2001

Note - plant names have been updated as per TSP Act schedules

Species	TSPA status 2006	TSPA status 2001	Change	Reason
<b>Vascular flora</b>				
<i>Boronia gunnii</i>	vulnerable	not listed	new listing	new species
<i>Boronia hemichiton</i>	endangered	not listed	new listing	new species
<i>Boronia hippopala</i>	vulnerable	not listed	new listing	new species
<i>Brachyscome tenuiscapa</i> var. <i>pubescens</i>	not listed	extinct	delisted	not in Tas.
<i>Calystegia sepium</i>	rare	extinct	down listed	survey
<i>Chamaesyce drummondii</i>	not listed	rare	delisted	not in Tas.
<i>Chorizandra enodis</i>	vulnerable	extinct	down listed	survey
<i>Cyathea cunninghamii</i>	endangered	not listed	new listing	data collation
<i>Epacris</i> aff. <i>exserta</i> 'Union Bridge'	not listed	not listed (listed as vulnerable 2003)	delisted	not valid taxon
<i>Epacris</i> aff. <i>virgata</i> 'graniticola'	vulnerable	not listed	new listing	data collation
<i>Eucalyptus gunnii</i> subsp. <i>divaricata</i>	endangered	not listed	new listing	new species
<i>Gahnia rodwayi</i>	not listed	rare	delisted	data collation
<i>Goodenia amplexans</i>	not listed	extinct	delisted	not in Tas.
<i>Hibbertia</i> sp. 'Pontville'	rare	not listed	new listing	new species
<i>Hovea tasmanica</i>	rare	not listed	new listing	data collation
<i>Isolepis setacea</i>	not listed	rare	delisted	not native
<i>Lachnagrostis aemula</i>	not listed	rare	delisted	data collation
<i>Mentha australis</i>	endangered	not listed (listed as extinct 2004)	new listing	survey
<i>Millotia tenuifolia</i> var. <i>tenuifolia</i>	not listed	rare	delisted	data collation
<i>Mirbelia oxylobioides</i>	vulnerable	rare	up listed	survey
<i>Ozothamnus reflexifolius</i>	vulnerable	not listed	new listing	new species
<i>Ozothamnus selaginoides</i>	endangered	extinct	up listed	rediscovery was new species
<i>Pimelea pauciflora</i>	not listed	rare	delisted	data collation
<i>Pneumatopteris pennigera</i>	endangered	vulnerable	uplisted	data collation
<i>Thelymitra benthamiana</i>	endangered	not listed	new listing	data collation
<i>Thelymitra malvina</i>	endangered	rare	up listed	data collation
<b>Non-vascular flora (all lichens)</b>				
<i>Bunodophoron notatum</i>	endangered	not listed	new listing	new information
<i>Calycidium cuneatum</i>	rare	not listed	new listing	new information
<i>Calycidium polycarpum</i>	rare	not listed	new listing	new information
<i>Erioderma solediatum</i>	endangered	not listed	new listing	new information
<i>Melanelia piliferella</i>	vulnerable	not listed	new listing	new information
<i>Menegazzia minuta</i>	endangered	not listed	new listing	new information
<i>Neofuscelia subloxodella</i>	endangered	not listed	new listing	new information
<i>Parmelina pallida</i>	endangered	not listed	new listing	new information
<i>Parmeliopsis ambigua</i>	rare	not listed	new listing	new information
<i>Parmeliopsis hyperopta</i>	rare	not listed	new listing	new information
<i>Roccellinastrum neglectum</i>	endangered	not listed	new listing	new information
<i>Xanthoparmelia jarmaniae</i>	vulnerable	not listed	new listing	new information
<i>Xanthoparmelia mannumensis</i>	vulnerable	not listed	new listing	new information
<i>Xanthoparmelia oleosa</i>	rare	not listed	new listing	new information
<i>Xanthoparmelia vicariella</i>	rare	not listed	new listing	new information
<b>Fauna</b>				
<i>Acanthiza pusilla archibaldi</i>	endangered	not listed	new listing	new information
<i>Acanthornis magnus greenianus</i>	endangered	not listed	new listing	new information
<i>Alcedo azurea diemensis</i>	endangered	not listed	new listing	new information
<i>Castiarina insculpta</i>	endangered	extinct	downlisting	Rediscovered
" <i>Discocharopa</i> " <i>vigens</i>	vulnerable	not listed	new listing	new information
<i>Enchymus</i> sp. nov.	rare	not listed	new listing	new information
<i>Engaeus granulatus</i>	endangered	not listed	new listing	new information
<i>Engaeus martigener</i>	endangered	not listed	new listing	new information
<i>Haliaeetus leucogaster</i>	endangered	not listed	new listing	new information
<i>Limnodynastes peroni</i>	rare	not listed	new listing	new information
<i>Oreisplanus munionga larana</i>	endangered	not listed	new listing	new information
<i>Platycercus caledonicus brownii</i>	vulnerable	not listed	new listing	new information

<b>Species</b>	<b>TSPA status 2006</b>	<b>TSPA status 2001</b>	<b>Change</b>	<b>Reason</b>
<i>Pseudalmenus chlorinda myrsilus</i>	rare	not listed	new listing	new information
<i>Pseudemoia pagenstecheri</i>	endangered	not listed	new listing	new information
<i>Pseudemoia rawlinsoni</i>	rare	not listed	new listing	new information
<i>Sarcophilus harrisii</i>	vulnerable	not listed	new listing	new information
<i>Tyto novaehollandiae castanops</i>	endangered	not listed	new listing	new information

## APPENDIX 1.3.a

**TABLE 1.3.a (i) Assessment of the potential risk to threatened and priority Tasmanian forest-associated flora species from loss of genetic diversity or isolation**

Species are those which are listed on Schedules of the Tasmanian *Threatened Species Protection Act*, or have been listed or proposed for listing as RFA priority species. Note that the list excludes orchid species.

<b>1. EXISTING AND PROPOSED RFA PRIORITY SPECIES LISTED UNDER TSP ACT</b>		
<b>Species assessed as potentially having a HIGH risk of genetic loss or isolation</b>		
<i>Acacia axillaris</i>	Midlands wattle	Listing statement
<i>Anogramma leptophylla</i>	Annual fern	Listing statement
<i>Arthropodium strictum</i>	Chocolate lily	
<i>Ballantinia antipoda</i>	Southern ballantine	
<i>Banksia serrata</i>	Saw banksia	
<i>Botrychium australe</i>	Parsley fern	
<i>Brachyscome perpusilla</i>	Tiny daisy	
<i>Brachyscome radicata</i>	Rooted daisy	
<i>Comesperma defoliatum</i>	Leafless milkwort	
<i>Cooperookia barbata</i>	Purple goodenia	
<i>Desmodium gunnii</i>	Slender tick trefoil	
<i>Discaria pubescens</i>	Hairy anchor plant	
<i>Epacris limbata</i>	Border heath	Recovery Plan
<i>Eucalyptus gunnii</i> subsp. <i>divaricata</i>	Miena cider gum	
<i>Eucalyptus morrisbyi</i>	Morrisby's gum	Flora Recovery Plan
<i>Euphrasia scabra</i>	Yellow eyebright	Listing statement & Recovery Plan
<i>Gratiola pubescens</i>	Hairy brooklime	
<i>Haloragis aspera</i>	Rough raspwort	
<i>Hypolepis distans</i>	Scrambling ground fern	Listing statement
<i>Isoetopsis graminifolia</i>	Grass cushions	
<i>Isolepis stellata</i>	Star club rush	
<i>Lachnagrostis punicea</i> subsp. <i>punicea</i>	Bristle blown-grass	
<i>Lasiopetalum discolor</i>	Coast velvet bush	
<i>Leucochrysum albicans</i> subsp. <i>albicans</i> var. <i>tricolor</i>	Grassland paper daisy	
<i>Lobelia pratioides</i>	Poison lobelia	
<i>Phebalium daviesii</i>	Davies' wax flower	Listing statement
<i>Pneumatopteris pennigera</i>	Lime fern	Listing statement
<i>Scaevola aemula</i>	Fairy fanflower	
<i>Scutellaria humilis</i>	Dwarf scullcap	
<i>Senecio macrocarpus</i>	Fluffy groundsel	
<i>Solanum opacum</i>	Green berry nightshade	
<i>Spyridium eriocephalum</i> var. <i>eriocephalum</i>	Heath spyridium	Listing statement
<i>Spyridium lawrencei</i>	Small leaf spyridium	Listing statement
<i>Stenopetalum lineare</i>	Threadcross	

<i>Tetratea ciliata</i>	Pink bells	
<i>Tmesipteris parva</i>	Small fork fern	Listing statement
<i>Vittadinia megacephala</i>	Giant New Holland daisy	
<i>Xanthorrhoea arenaria</i>	Sand grass tree	Recovery Plan
<i>Zieria veronicea</i> subsp. <i>veronicea</i>	Pink zieria	
<b>Species assessed as potentially having a MODERATE risk of genetic loss or isolation</b>		
<i>Acacia siculiformis</i>	Dagger wattle	
<i>Acacia ulicifolia</i>	Juniper wattle	
<i>Agrostis diemenica</i>	Flat-leaf southern bent	
<i>Alternanthera denticulata</i>	Lesser joyweed	
<i>Amphibromus macrorhinus</i>	Long-nosed swamp wallaby grass	
<i>Amphibromus neesii</i>	Swamp wallaby grass	
<i>Asperula minima</i>	Grassy woodruff	
<i>Asperula scoparia</i> var. <i>scoparia</i>	Prickly woodruff	
<i>Asperula subsimplex</i>	Water woodruff	
<i>Australina pusilla</i> subsp. <i>muelleri</i>	Mueller's small shade nettle	
<i>Austrocynoglossum latifolium</i>	Forest hound's tongue	
<i>Barbarea australis</i>	Native wintercress	Listing statement
<i>Bertya tasmanica</i> subsp. <i>tasmanica</i>	Tasmanian bertya	Listing statement
<i>Blechnum cartilagineum</i>	Gristle fern	Listing statement
<i>Brachyscome rigidula</i>	Hairy cutleaf daisy	
<i>Brunonia australis</i>	Blue pincushion	
<i>Callitris oblonga</i> subsp. <i>oblonga</i>	South Esk pine	Draft Recovery Plan
<i>Centipeda cunninghamii</i>	Common sneezeweed	
<i>Colobanthus curtisiae</i>	Curtis' colobanth	Listing statement
<i>Conospermum hookeri</i>	Variable smoke bush	Listing statement
<i>Cryptandra amara</i>	Bitter cryptandra	
<i>Cyathea cunninghamii</i>	Slender treefern	Listing statement
<i>Dianella amoena</i>	Grassland flaxlily	
<i>Epacris barbata</i>	Bearded heath	Recovery Plan
<i>Epacris exserta</i>	South Esk heath	Recovery Plan
<i>Eryngium ovinum</i>	Blue devil	
<i>Eucalyptus perriniana</i>	Spinning gum	
<i>Euphrasia semipicta</i>	Peninsula eyebright	Recovery Plan
<i>Glycine latrobeana</i>	Clover glycine	
<i>Glycine microphylla</i>	Small-leaf glycine	
<i>Goodenia geniculata</i>	Bent goodenia	
<i>Grevillea australis</i> var. <i>linearifolia</i>	Narrow-leaf southern grevillea	
<i>Grevillea australis</i> var. <i>planifolia</i>	Flat-leaf southern grevillea	
<i>Gynatrix pulchella</i>	Common hemp bush	
<i>Gyrostemon thesioides</i>	Broom wheel fruit	
<i>Hedycarya angustifolia</i>	Austral mulberry	
<i>Hibbertia virgata</i>	Twiggy guinea flower	

<i>Hyalosperma demissum</i>	Moss sunray	
<i>Hypolepis muelleri</i>	Harsh ground fern	
<i>Isolepis habra</i>	Alpine club rush	
<i>Juncus prismatocarpus</i>	Branching rush	
<i>Leucopogon lanceolatus</i> var. <i>lanceolatus</i>	Lance beard heath	
<i>Lycopus australis</i>	Native gipsywort	
<i>Olearia hookeri</i>	Hooker's daisy bush	
<i>Persicaria decipiens</i>	Slender knotweed	
<i>Persicaria subsessilis</i>	Bristly knotweed	
<i>Persoonia gunnii</i> var. <i>oblanceolata</i>	Gunn's geebung	
<i>Pimelea axiflora</i> subsp. <i>axiflora</i>	Bootlace bush	
<i>Pimelea curviflora</i> var. <i>gracilis</i>	Slender curved rice flower	
<i>Pimelea curviflora</i> var. <i>sericea</i>	Curved rice flower	
<i>Pimelea flava</i> subsp. <i>flava</i>	Yellow rice flower	
<i>Prostanthera rotundifolia</i>	Roundleaf mint bush	
<i>Pultenaea prostrata</i>	Prostrate bush pea	
<i>Tetratheca gunnii</i>	Shy susan	Listing statement & Recovery Plan
<i>Tricoryne elatior</i>	Yellow rush lily	
<i>Velleia paradoxa</i>	Spur velleia	
<i>Viminaria juncea</i>	Golden spray	Listing statement
<i>Vittadinia gracilis</i>	Woolly New Holland daisy	
<i>Westringia angustifolia</i>	Scabrous westringia	
<i>Xanthorrhoea bracteata</i>	Shiny grass tree	Recovery Plan
<i>Xerochrysum bicolor</i>	White alpine everlasting	
<i>Xerochrysum palustre</i>	Swamp everlasting	
<b>Species assessed as potentially having a LOW risk of genetic loss or isolation</b>		
<i>Acacia mucronata</i> subsp. <i>dependens</i>	Variable willow wattle	
<i>Acacia pataczekii</i>	Wally's wattle	
<i>Acacia retinodes</i> var. <i>uncifolia</i>	Wirilda	
<i>Agrostis australiensis</i>	Southern bent	
<i>Allocasuarina crassa</i>	Capes she-oak	
<i>Allocasuarina duncanii</i>	Duncan's she-oak	Listing statement
<i>Argentipallium spiceri</i>	Spicer's everlasting	Listing statement & Recovery Plan
<i>Aristida benthamii</i> var. <i>benthamii</i>	Three-awned spear grass	
<i>Asplenium hookerianum</i>	Hooker's spleenwort	Listing statement
<i>Australopyrum velutinum</i>	Mountain wheat grass	
<i>Baumea gunnii</i>	Slender twig rush	
<i>Boronia gunnii</i>	Gunn's boronia	
<i>Boronia hemichiton</i>	Mt Arthur boronia	
<i>Boronia hippopala</i>	Velvet boronia	
<i>Bossiaea obcordata</i>	Spiny bossiaea	
<i>Brachyglottis brunonis</i>	Brown's tree daisy	
<i>Brachyloma depressum</i>	Spreading brachyloma	
<i>Brachyscome sieberi</i> var. <i>gunnii</i>	Sieber's daisy	

<i>Caesia calliantha</i>	Blue grass lily	
<i>Calystegia sepium</i>	Great bindweed	
<i>Carex gunniana</i>	Mountain sedge	
<i>Carex longebrachiata</i>	Drooping sedge	
<i>Carex tasmanica</i>	Curly sedge	
<i>Caustis pentandra</i>	Thick twist rush	
<i>Cheilanthes distans</i>	Bristly cloak fern	Listing statement
<i>Chorizandra enodis</i>	Black bristle-rush	
<i>Cyathea Xmarcescens</i>	Skirted treefern	Listing statement
<i>Deyeuxia apsleyensis</i>	Apsley bent grass	
<i>Deyeuxia benthamiana</i>	Bentham's bent grass	
<i>Deyeuxia brachyathera</i>	Short bent grass	
<i>Deyeuxia decipiens</i>	Trickery bent grass	
<i>Deyeuxia minor</i>	Small bent grass	
<i>Doodia caudata</i>	Small rasp fern	Listing statement
<i>Dryopoa dives</i>	Giant mountain grass	
<i>Ehrharta juncea</i>	Forest wire grass	
<i>Elaeocarpus reticulatus</i>	Blueberry ash	
<i>Epacris acuminata</i>	Clasping-leaf heath	Recovery Plan
<i>Epacris aff. virgata 'graniticola'</i>	Mt Cameron heath	Recovery Plan
<i>Epacris apsleyensis</i>	Apsley heath	Recovery Plan
<i>Epacris curtisiae</i>	Curtis' heath	
<i>Epacris glabella</i>	Funnel heath	Recovery Plan
<i>Epacris grandis</i>	Great heath	Recovery Plan
<i>Epacris virgata</i>	Pretty heath	Recovery Plan
<i>Eucalyptus barberi</i>	Barbers gum	
<i>Eucalyptus globulus</i> subsp. <i>pseudoglobulus</i>	Gippsland blue gum	
<i>Eucalyptus radiata</i> subsp. <i>robertsonii</i>	Forth River peppermint	Public Authority Management Agreement between Forestry Tasmania and DPIW.
<i>Eucalyptus risdonii</i>	Risdon peppermint	
<i>Euphrasia collina</i> subsp. <i>deflexifolia</i>	Eastern eyebright	Recovery Plan
<i>Euphrasia fragosa</i>	Shy eyebright	Listing statement & Recovery Plan
<i>Euphrasia gibbsiae</i> subsp. <i>psilantherea</i>	Swamp eyebright	Listing statement & Recovery Plan
<i>Hakea ulicina</i>	Furze hakea	
<i>Hibbertia calycina</i>	Lesser guinea flower	
<i>Hierochloe rariflora</i>	Cane holy grass	
<i>Hovea corrickiae</i>	Glossy hovea	
<i>Hovea montana</i>	Mountain hovea	
<i>Hovea tasmanica</i>	Hill hovea	
<i>Isopogon ceratophyllus</i>	Horny cone bush	
<i>Juncus amabilis</i>	Gentle rush	
<i>Juncus vaginatus</i>	Clustered rush	
<i>Lasiopetalum micranthum</i>	Tasmanian velvet bush	
<i>Lepidium pseudotasmanicum</i>	Shade peppergrass	

<i>Lepidosperma tortuosum</i>	Twisting rapier sedge	
<i>Lobelia rhombifolia</i>	Branched lobelia	
<i>Lomatia tasmanica</i>	King's lomatia	Recovery Plan
<i>Lythrum salicaria</i>	Purple loosestrife	
<i>Melaleuca pustulata</i>	Cranbrook paperbark	
<i>Micrantheum serpentinum</i>	Serpentine micrantheum	Listing statement
<i>Mirbelia oxylobioides</i>	Mountain mirbelia	
<i>Monotoca submutica</i> var. <i>autumnalis</i>	Roundleaf broom heath	
<i>Muehlenbeckia axillaris</i>	Matted lignum	
<i>Odixia achlaena</i>	Odixia	
<i>Ozothamnus lycopodioides</i>	Lycopoid everlasting	
<i>Ozothamnus reflexifolius</i>	Reflexed everlasting	
<i>Ozothamnus selaginoides</i>	Clubmoss everlasting	
<i>Pandorea pandorana</i>	Wonga vine	
<i>Pellaea calidirupium</i>	Hot rock fern	
<i>Pentachondra ericifolia</i>	Matted carpet heath	
<i>Persoonia muelleri</i> subsp. <i>angustifolia</i>	Mueller's geebung	
<i>Pherosphaera hookeriana</i>	Drooping pine	
<i>Pimelea filiformis</i>	Trailing rice flower	
<i>Planocarpa nitida</i>	Shiny cheeseberry	
<i>Plantago debilis</i>	Shade plantain	
<i>Plantago gaudichaudii</i>	Narrow plantain	
<i>Poa mollis</i>	Soft poa grass	
<i>Polyscias</i> aff. <i>sambucifolia</i>	Elderberry panax	Listing statement
<i>Ranunculus pumilio</i> var. <i>pumilio</i>	Ferny buttercup	
<i>Ranunculus sessiliflorus</i> var. <i>sessiliflorus</i>	Annual buttercup	
<i>Rhytidosporum inconspicuum</i>	Alpine appleberry	Listing statement
<i>Scleranthus brockiei</i>	Brock knawel	
<i>Scleranthus diander</i>	Tufted knawel	
<i>Scleranthus fasciculatus</i>	Spreading knawel	
<i>Senecio squarrosus</i>	Leafy groundsel	
<i>Senecio velleioides</i>	Forest groundsel	
<i>Spyridium parvifolium</i> var. <i>molle</i>	Soft furneaux spyridium	
<i>Spyridium parvifolium</i> var. <i>parvifolium</i>	Australian dusty miller	
<i>Stellaria multiflora</i>	Rayless starwort	
<i>Stonesiella selaginoides</i>	Clubmoss bush pea	
<i>Taraxacum cygnorum</i>	Coast dandelion	
<i>Teucrium corymbosum</i>	Forest germander	
<i>Thryptomene micrantha</i>	Ribbed thryptomene	Listing statement
<i>Veronica notabilis</i>	Forest speedwell	
<i>Viola caleyana</i>	Swamp violet	
<i>Viola cunninghamii</i>	Cunningham's violet	
<i>Viola hederacea</i> subsp. <i>curtisiae</i>	Curtis' violet	
<i>Zieria littoralis</i>	Dwarf zieria	

Species assessed as having an UNKNOWN risk of genetic loss or isolation		
<i>Aphelia gracilis</i>	slender aphelia	
<i>Aphelia pumilio</i>	dwarf aphelia	
<i>Austrodanthonia induta</i>	tall wallaby grass	
<i>Austrostipa bigeniculata</i>	double-jointed spear grass	
<i>Austrostipa blackii</i>	crested spear grass	
<i>Austrostipa nodosa</i>	knotty spear grass	
<i>Austrostipa scabra</i>	rough spear grass	
<i>Bedfordia arborescens</i>	blanket leaf	listing statement
<i>Centaurium spicatum</i>	Australian centaury	
<i>Chrysocephalum baxteri</i>	fringed everlasting	
<i>Cyphanthera tasmanica</i>	Tasmanian ray flower	
<i>Dianella longifolia</i> var. <i>longifolia</i>	pale flax lily	
<i>Gompholobium ecostatum</i>	dwarf wedge pea	
<i>Haloragis heterophylla</i>	variable raspwort	
<i>Hardenbergia violacea</i>	purple coral pea	listing statement
<i>Hibbertia</i> sp. 'Pontville'	basalt guineaflower	
<i>Hydrocotyle comocarpa</i>	fringe-fruit pennywort	
<i>Hydrocotyle laxiflora</i>	stinking pennywort	
<i>Hypoxis vaginata</i>	sheathing yellow-star	
<i>Lachnagrostis aequata</i>	even blown-grass	
<i>Lepidium hyssopifolium</i>	basalt peppercress	
<i>Lepidosperma viscidum</i>	sticky sword sedge	
<i>Leucopogon virgatus</i> var. <i>brevifolius</i>	shortleaf beard heath	
<i>Levenhookia dubia</i>	hairy stylewort	
<i>Mentha australis</i>	river mint	
<i>Pomaderris elachophylla</i>	small leaf pomaderris	
<i>Pomaderris intermedia</i>	tree pomaderris	
<i>Pomaderris oraria</i> subsp. <i>oraria</i>	coast pomaderris	
<i>Pomaderris phyllicifolia</i> subsp. <i>phyllicifolia</i>	narrow leaf pomaderris	
<i>Pultenaea humilis</i>	dwarf bush pea	
<i>Pultenaea mollis</i>	Guinea flower bush pea	
<i>Siloxerus multiflorus</i>	small wrinklewort	
<i>Spyridium obcordatum</i>	creeping spyridium	Listing statement
<i>Spyridium vexilliferum</i>	winged spyridium	
<i>Stenanthemum pimeleoides</i>	spreading stenanthemum	
<i>Thismia rodwayi</i>	fairy lanterns	Listing statement
<i>Uncinia elegans</i>	handsome hook sedge	
<i>Veronica plebeia</i>	trailing speedwell	
<i>Vittadinia cuneata</i> var. <i>cuneata</i>	fuzzy New Holland daisy	
<i>Vittadinia muelleri</i>	narrow leaf New Holland daisy	
<i>Westringia brevifolia</i> var. <i>raleighii</i>	native rosemary	

<b>2. PROPOSED RFA PRIORITY FLORA NOT LISTED ON TSP ACT OR EPBC ACT</b>		
<b>Species assessed as potentially having a MODERATE risk of genetic loss or isolation</b>		
<i>Arthropodium minus</i>	small vanilla-lily	
<i>Epacris marginata</i>	rigid heath	
<i>Xanthorrhoea australis</i>	sand grasstree	
<b>Species assessed as potentially having a LOW risk of genetic loss or isolation</b>		
<i>Cyathodes platystoma</i>	tall cheesberry	
<i>Epacris franklinii</i>	western riverheath	
<i>Epacris mucronulata</i>	southern riverheath	
<i>Epacris</i> sp. Puzzler Gorge	Puzzler Gorge heath	
<i>Epacris virgata</i> (Kettering)	pretty heath	
<i>Epacris virgata</i> (Beaconsfield)	pretty heath	
<i>Eucalyptus archeri</i>	alpine cider gum	
<i>Eucalyptus cordata</i>	Tasmanian silver gum	
<i>Euphrasia</i> aff. <i>diemenica</i>	middle eyebright	
<i>Festuca plebeia</i>	Tasmanian fescue	
<i>Rytidosperma nitens</i>	shiny wallabygrass	
<b>Species assessed as having an UNKNOWN risk of genetic loss or isolation</b>		
<i>Asplenium trichomanes</i> subsp. <i>trichomanes</i>	dolerite spleenwort	
<i>Austrostipa scabra</i> subsp. <i>falcata</i>	rough speargrass	
<i>Austrostipa scabra</i> subsp. <i>scabra</i>	sickle speargrass	
<i>Calystegia marginata</i>	forest bindweed	
<i>Carex bichenoviana</i>	plains sedge	
<i>Desmodium varians</i>	slender ticktrefoil	
<i>Epacris exserta</i> (narrow sense)	South Esk heath	
<i>Grevillea australis</i> var. <i>tenuifolia</i>	slender grevillea	
<i>Vittadinia burbidgeae</i>	smooth new-holland-daisy	

**TABLE 1.3.a(ii) Assessment of the risk to Tasmanian threatened vertebrate fauna from loss of genetic diversity or isolation**

The table also indicates whether a Recovery Plan has been developed for species, and the status of species on the Tasmanian *Threatened Species Protection Act*.

Abbreviations used to represent status: x = extinct; e = endangered; v = vulnerable; r = rare

<b>Species assessed as potentially having a HIGH risk of genetic loss or isolation</b>				
Fish	<i>Galaxias auratus</i>	golden galaxias	Recovery plan	r
Fish	<i>Galaxias fontanus</i>	Swan galaxias	Recovery plan	e
Amphibian	<i>Limnodynastes peroni</i>	Perons Marsh frog		r
Bird	<i>Neophema chrysogaster</i>	orange-bellied parrot	Recovery plan	e
Bird	<i>Pardalotus quadragintus</i>	forty-spotted pardalote	Recovery Plan	e
Bird	<i>Platycercus caledonicus brownii</i>	King Island green rosella		v
Bird	<i>Acanthornis magnus greenianus</i>	King Island scrubtit		e
Bird	<i>Acanthiza pusilla archibaldi</i>	King Island thornbill		e
Mammal	<i>Sarcophilus harrisii</i>	Tasmanian devil		v
Mammal	<i>Pseudomys novaehollandiae</i>	New Holland mouse		e
<b>Species assessed as potentially having a MODERATE risk of genetic loss or isolation</b>				
Fish	<i>Galaxiella pusilla</i>	dwarf galaxias	Recovery plan	r
Bird	<i>Lathamus discolor</i>	swift parrot	Recovery plan	e
Mammal	<i>Dasyurus maculatus</i>	spotted-tailed quoll		r
<b>Species assessed as potentially having a LOW risk of genetic loss or isolation</b>				
Fish	<i>Galaxias johnstoni</i>	Clarence galaxias	Recovery plan	e
Fish	<i>Galaxias tanycephalus</i>	saddled galaxias	Recovery plan	e
Fish	<i>Prototroctes maraena</i>	Australian grayling		e
Amphibian	<i>Litoria raniformis</i>	green and golden frog	Listing statement	v
Reptile	<i>Pseudemoia pagenstecheri</i>	tussock skink		x
Bird	<i>Haliaeetus leucogaster</i>	ehite-bellied sea eagle	Recovery plan	e
Bird	<i>Aquila audax</i>	wedge-tailed eagle	Recovery plan	e
Bird	<i>Accipiter novaehollandiae</i>	grey goshawk		e
Bird	<i>Tyto novaehollandiae</i>	masked owl		e
Bird	<i>Alcedo azurea</i>	azure kingfisher		e
Mammal	<i>Perameles gunnii</i>	eastern barred-bandicoot	Recovery plan	v
Mammal	<i>Vombatus ursinus ursinus</i>	common wombat (Bass Strait)		v
<b>Species assessed as having an UNKNOWN risk of genetic loss or isolation</b>				
Reptile	<i>Pseudemoia rawlinsoni</i>	glossy grass skink		r

## APPENDIX 3.1.a Forest pest and disease situation in Tasmania between 2001 and 2006

### 1(a) Insect pests in *Pinus radiata* plantations

	2001-02	2002-03	2003-04	2004-05	2005-06
Sirex wood wasp ( <i>Sirex noctilio</i> )	Two outbreaks treated (Ranelagh, Montagu). Low levels elsewhere	Increase incidence in NE. Traps trees installed in four compartments	Nematodes introduced in four compartments in NE. Three other compartments had low levels (no action)	Nematode control very successful. High levels of <i>Ibalia</i> parasitism at all sites. Use of static traps in plantation showed method was a more sensitive detection tool than current.	Populations remain low.
Five-spined bark beetle ( <i>Ips grandicollis</i> )	Not know to be present	Not know to be present (trapping done)	Not know to be present (trapping done)	Not know to be present (trapping done)	Not know to be present (trapping done)
Other wood and bark beetles	Small outbreak of <i>Hylastes ater</i> (several hectares) in eastern plantation. Scattered mortality (low) after slashing wildlings in several northern plantations	High populations of <i>Hylurgus ligniperda</i> and <i>Hadrobregmus australiensis</i> developed in fire-damaged plantation at Pittwater. Some attack of fire-killed trees by the bupresid <i>Melobasis hypocrita</i>	Two unidentified scolytid beetles captured in static traps	High populations of <i>Hylastes ater</i> and <i>Hylurgus ligniperda</i> captured in static traps in several ports with pine plantations nearby. No damage reported in plantations.	<i>Hylastes ater</i> detected at Warra LTER. Nearest <i>P. radiata</i> 17 km to east.
Monterey pine aphid ( <i>Essigella californica</i> )	Low incidence in south causing negligible damage. Not present in north.	Status unchanged	Status unchanged	Status unchanged	Moderate defoliation in Pittwater, elsewhere in south causing negligible damage. Not present in north.
Pine aphid <i>Eulachnus thunbergii</i>	Not know to be present	Not know to be present	Not know to be present	Not know to be present	Not know to be present
Pine aphid ( <i>Pineus laevis</i> )	Widespread and generally at very low incidence (<1% of	Widespread and generally at very low incidence. Moderate	Status unchanged	Status unchanged. Mainly affects roadside wildling regeneration.	Status unchanged.

	2001-02	2002-03	2003-04	2004-05	2005-06
	trees). On poor sites in NE nearly 2% of trees had light damage.	incidence in wildling regeneration on poor sites in NE.			
Defoliating insects	Localised outbreak of <i>Teia anartoide</i> caused minor defoliation in the Plenty Valley.	No outbreaks reported	No outbreaks reported	No outbreaks reported	No outbreaks reported

### 1(b) Diseases in *Pinus radiata* plantations

	2001-02	2002-03	2003-04	2004-05	2005-06
Red-band needle blight ( <i>Dothistroma septosporum</i> )	More prevalent in north this year following 2-3 months of above average rain. Severity of damage low.	Widespread at low incidence and severity. Localised hot spot of about 80 ha in northeast had moderate - severe defoliation.	Status unchanged	Status unchanged	Status unchanged
Spring needle cast (including <i>Cyclaneusma minus</i> )	Prevalent and severe in high, wet plantations. Moderate levels of SNC detected in Plenty Valley has expanded know range.	Status unchanged	Status unchanged	Status unchanged. Decision made to adopt silvicultural regimes predicted to reduce impact of SNC.	Status unchanged
Crown wilt ( <i>Diplodia pini</i> )	Very low incidence of scattered trees with crown wilt throughout SE and parts of NE	No fresh cases detected	Several small (<1 ha) patches detected in the central north and upper Derwent Valley. Damage concentrated on shallow, rocky soils after recent droughts.	Branch dieback affected about 250 ha in central north after a storm event. <i>Diplodia</i> and other wound pathogens ( <i>Pestalotiopsis</i> and <i>Dichomera</i> ) were recovered.	Less prevalent than in previous years. Scattered crown wilt at low incidence in about 75ha in NE
Root and collar rots	None reported	None reported	<i>Phytophthora cinnamomi</i> implicated for poor survival in 30 ha in the central north (flat, water receiving sites). Mortality due to undiagnosed root and collar rots were found on two stands in NW.	None reported	None reported

**1(c) Environmental and site-related problems in *Pinus radiata* plantations**

	2001-02	2002-03	2003-04	2004-05	2005-006
Lightning	No problems reported	Patch deaths (10-20 trees) in several NE plantations.	Patch deaths continue to be seen in NE and central north.	Incidence lower than in previous two years.	Several patch deaths (about 10 trees each) in central north
Wind	No problems reported	Windthrow / stem breakage in two very localised patches (<3ha) in east and NE.	No problems were reported	Plantations in central north suffered damage following severe storm in 2004. Worst affected was Branches Creek where 60 ha suffered windthrow and stem breakage.	Area of approx. 80ha in the Derwent Valley suffered windthrow of 5-25% of trees. Localised small patches of severe damage (90% of trees blown over or snapped-off) in NE.
Nutrient disorders	No problems reported	No problems reported	No problems reported	Symptoms of boron deficiency in 1-5% of trees across 210ha in NE (Maweena soil profile)	Status unchanged

**1(d) Vertebrate Pest Browsers in *Pinus radiata* plantations**

	2001-02	2002-03	2003-04	2004-05	2005-06
Wallaby bark stripping			Wallaby bark stripping remains widespread but levels of mortality are low. Only three compartments in the north suffered significant mortality.	Levels declined from previous years. Mortality generally below 1% although 40ha in NE was mapped as having >5% mortality.	Wallaby bark stripping recorded in 620 ha at low-moderate incidence. Mortality generally <1% except for 70ha in south where it reached 40%.
Possum bark stripping				Possum bark stripping caused moderate levels of damage in 60 ha on NW in plantations that have a long history of bark stripping.	Possum bark stripping detected in 177 ha in central north and Derwent Valley at incidences ranging 10-40%. Top-death usually <5%.
Shoot browsing				Shoot browsing was recorded in 65 ha in NE. In the worst affected area only 10% of trees remained.	Shoot browsing recorded in 39ha. Damage was sufficiently severe to warrant replanting 28 ha.

## 2(a) Insect pests in *Eucalyptus* plantations

	2001-02	2002-03	2003-04	2004-05	2005-06
Leaf beetles ( <i>Chrysophtharta</i> spp.)	Over-threshold populations that requiring spraying occurred in 10% of the estate between ages 2-5 y.o. <i>C. agricola</i> was most common with an average of 2.2% of trees damage. <i>C. bimaculata</i> were half that. Highest incidence of 4.4% of trees was recorded from the central north.	Monitoring was done in 9,451 ha. Spraying to control over-threshold populations was done on 803 ha.	Over-threshold populations measured in 2612 ha of which 950 ha were sprayed. Spraying was restricted by weather conditions and availability of helicopters because of fire fighting commitments.	Populations higher than in previous years. Over-threshold populations in 5533 ha of which 3472 were sprayed. Late season damage continues to be a problem and several affected plantations at high altitude suffered significant shoot death over winter.	Populations comparable with 2004-5. Above-threshold populations in 6695 ha of which 3589 were sprayed. Less late-season damage than previous years – 10ha mapped as severe.
Eucalypt weevil ( <i>Gonipterus scutellatus</i> )	None reported	Moderate defoliation experienced in several plantations (total area 65 ha) in SE.	Several 2-4 y.o plantations in SE and NW suffered moderate defoliation. Very low levels of egg parasitism were detected.	High egg populations in admixture with leaf beetles were recorded in 1431ha of the 3472 ha sprayed for leaf beetles. Egg parasitism did not begin to increase until early summer.	Over-threshold populations (with leaf beetles) in 334 ha of which 275 were sprayed. About 60 ha sustained moderate defoliation.
Autumn gum moth ( <i>Mnesampela privata</i> )	Larvae were recorded on 0.5% of trees statewide with the highest incidence of 1.4% in the NW. Low levels (<25%) of defoliation throughout.	AGM detected in 438 ha in NE of which 250 ha experienced low-moderate damage.	Low levels of activity throughout the estate.	Low levels of activity throughout the estate.	Developing outbreak in NE affecting 540 ha was sprayed. Severe damage was limited to a single small plantation.
Gum leaf skeletoniser ( <i>Uraba lugens</i> )	None reported	Detected in four plantations but only a small area (5 ha)	No significant damage reported	Moderate levels of edge tree defoliation in two <i>E. nitens</i>	No significant damage reported

	2001-02	2002-03	2003-04	2004-05	2005-06
		reached moderate levels of defoliation.		plantations in NE	
Other defoliating insects	Sawflies ( <i>Perga affinis</i> ) continue to defoliate trees in woodlots and shelterbelts in the Midlands.	No reports of damage by other defoliators	Sawflies ( <i>Perga affinis</i> ) were found occasionally causing localised damage to individual trees..	No other recorded as causing damage.	Sawflies ( <i>Lophyrotoma interrupta</i> ) detected in one northern plantation: Damage was negligible.

**2(a) Insect pests in *Eucalyptus* plantations (cont'd)**

	2001-02	2002-03	2003-04	2004-05	2005-06
Psyllids	No significant psyllid problems were reported.	No significant psyllid problems were reported. <i>Ctenarytaina</i> (Blue gum psyllid) is widespread but causing little damage.	An <i>E. nitens</i> plantation in the SE suffered significant premature leaf loss following an outbreak of <i>Cardiaspina squamula</i> . High levels of parasitism by late summer resulted in a population crash.	Moderate levels of premature leaf senescence due to <i>Hyalinaspis</i> spp. in three plantations in SE. <i>Ctenarytaina</i> (Blue gum psyllid) widespread but causing little damage.	<i>Hyalinaspis</i> caused moderate damage to 100 ha on <i>E. nitens</i> in the south. <i>Cardiaspina squamula</i> caused moderate damage to 2 ha of <i>E. nitens</i> in lower Derwent Valley.
Stem borers	<i>Phoracantha mastersii</i> continues to cause very localised patch deaths. Manly restricted to stressed trees on drought prone or waterlogged sites.	Localised or scattered mortality detected in five plantations ranging in age from 4-13 years. Mostly due to cerambycids, particularly <i>Coptocercus rubrides</i> .	<i>Phoracantha mastersii</i> associated with localised patch death at sites of poor drainage or disturbance from roading. Unsuccessful <i>Culama</i> attack is common on young (6 mo – 2 yr) <i>E. globulus</i> in the south.	Drought conditions in central north attributed to significant mortality from borer attack (multiple species) in a 6 y.o. <i>E. nitens</i> plantation.	Mortality from borer attack (multiple species) continued in a drought-stressed <i>E. nitens</i> plantation in the central north.
Shoot borers	None reported	None reported	None reported	None reported	High population of <i>Orthorhinus</i> sp. detected in one southern plantation caused little damage.
Shoot webbers	None reported	None reported	None reported	None reported	High population of <i>Epiphyas</i> sp. affected about 80% of trees in one southern plantation. Damage was minor.

## 2(b) Diseases in Eucalyptus spp. plantations

	2001-02	2002-03	2003-04	2004-05	2005-06
Mycosphaerella leaf disease ( <i>Mycosphaerella nubilosa</i> , <i>M. cryptica</i> )	Severe epidemic in far NW with 6 out of 10 plantation areas suffering moderate to severe defoliation. Locally severe defoliation also experienced in SE.	Drier spring – summer throughout much of the state resulted in little MLD this year.	Drier conditions in winter and spring 2003 resulted in little MLD this year.	Continued dry conditions– only 60 ha in NE suffered heavy early spring defoliation.	Little activity due to dry conditions in all except south where moderate damage was mapped in 23 ha.
Stem canker ( <i>Botryosphaeria ribis</i> , <i>Cryphonectria eucalypti</i> )	Local epidemic of <i>Cryphonectria eucalypti</i> in a 12 y.o. <i>E. nitens</i> plantation in south. A high proportion of trees were affected although only a few severely enough to cause mortality.	No problems were reported	No problems were reported	Stem lesions thought to be <i>Botryosphaeria ribis</i> were abundant in 5 ha of a 5-y.o. <i>E. nitens</i> plantation in central north	<i>Botryosphaeria</i> top death affected 27ha of 1-2 y.o. <i>E. nitens</i> following extended drought in NE. Localised mortality due to <i>Cryphonectria</i> stem cankers following thinning of an <i>E. nitens</i> plantation in NE highlands.
Phytophthora root rot ( <i>Phytophthora cinnamomi</i> )	None reported	None reported	None reported	Mortality of 1-2 y.o. <i>E. nitens</i> recorded at a low incidence (<2%) in 110 ha in NE.	Mortality of 1-2 y.o. <i>E. nitens</i> at incidences ranging between 1-20% (mostly low) mapped in 313 ha in NE and NW.
Armillaria root rot ( <i>Armillaria</i> spp.)	None reported.	Continues to be reported at low incidence in young plantations. Localised patch death of about twenty trees in a 10-y.o. <i>E. nitens</i> plantation in NE.	Continues to be reported at low incidence in young plantations. Localised patch death reported last year in NE continues to expand.	Small, localised patch death recorded in 2 5-y.o. <i>E. nitens</i> plantations.	Localised mortality in three small patches (0.1- 0.7 ha) reported from the north.

**2(c) Environmental and site-related problems in *Eucalyptus* spp. plantations**

	2001-02	2002-03	2003-04	2004-05	2005-06
Wind and storm	None reported	None reported	Several stands in NE suffered severe windthrow after thinning.	Moderate levels of post-thinning windthrow mapped in 45 ha in NE. A hail storm damaged 10 ha of a 2-y.o. <i>E. globulus</i> plantation in the central north.	Post-thinning windthrow mapped in 117 ha at incidences generally <1% but increasing to 5% in local hot-spots.
Drought	None reported	SE experienced lowest summer rainfall on record. Localised patch deaths (up to 0.5 ha) associated with shallow soil were detected in 14 plantations.	Two stands in NE reported scattered mortality after thinning. Drought stress predisposing trees to secondary attack (borers and <i>Armillaria</i> ) suspected.	Drought conditions in central north attributed to significant mortality in a 5 y.o. <i>E. nitens</i> plantation following secondary attack by borers and canker fungi.	Drought conditions in NE attributed to <i>Botryosphaeria</i> top death in young <i>E. nitens</i> .
Nutrient deficiencies / imbalance	None reported	None reported	None reported	Symptoms of copper deficiency were widespread throughout the state. Good recovery after copper fertilising.	Copper deficiency symptoms reported in 167ha, primarily in NW.

**2(d) Vertebrate pests in *Eucalyptus* spp. plantations**

	2001-02	2002-03	2003-04	2004-05	2005-06
Shoot browsing			Severe shoot browsing resulted in 120 ha of 2001 plantation failing to establish by age 2.	Severe shoot browsing was recorded in twelve 1-2 y.o. plantations. Worst affected were plantations at moderate to high altitudes.	Severe damage reported in 433 ha of mainly <i>E. nitens</i> . Damage was sufficiently severe to warrant replanting in 89 ha of this.
Possum bark stripping			Possum bark stripping was reported for the first time in a 10 ha patch in 4-y.o. <i>E. nitens</i> plantation in the upper Derwent Valley.		

### 3(a) Insect pests of native forest

	2001-02	2002-03	2003-04	2004-05	2005-06
Leaf beetles ( <i>Chrysophtharta</i> spp.)			No problems reported	No problems reported	No problems reported
Gum leaf skeletoniser ( <i>Uraba lugens</i> )		Developing outbreak causing severe defoliation of large areas of mature <i>E. obliqua</i> , <i>E. viminalis</i> and <i>E. amygdalina</i> in the Fingal Valley.	No problems reported	No problems reported	Indications of a population up-turn at several east coast sites.
Other defoliating insects		Outbreak of peppermint looper ( <i>Paraloea aphotista</i> ) causing severe defoliation of <i>E. amygdalina</i> and <i>E. viminalis</i> dry forests along the east coast.	No problems reported	No problems reported	No problems reported
Stem borers			No problems reported	No problems reported	No problems reported

### 3(b) Diseases of native forest

	2001-02	2002-03	2003-04	2004-05	2005-06
Leaf diseases	No problems reported	No problems reported	No problems reported	No problems reported	Late summer rain event in SE triggered an epidemic of <i>Mycosphaerella cryptica</i> in eucalypt regeneration in the Southern Forests.
Phytophthora root rot ( <i>Phytophthora cinnamomi</i> )	No problems reported	No problems reported	No problems reported	New roadside infestations mapped along Dark Creek Rd in Arthur-Frankland Priority Management Area. Question if new infection or renewed activity of old infection.	New roadside infestations mapped along eastern perimeter of Dempster Plains Priority Management Area
Armillaria root rot ( <i>Armillaria</i> spp.)	No problems reported	No problems reported	No problems reported	Local infestation of <i>A. hinnulea</i> causing basal cankers in <i>E. regnans</i> regrowth in NE.	No problems reported

### Environmental problems in native forest

	2001-2	2002-3	2003-4	2004-5	2005-6
Drought		Record summer drought resulted in widespread mortality in the SE where patch deaths of <i>Eucalyptus</i> , <i>Allocasuarina</i> etc occurred on area of shallow soil.			
Unexplained dieback / decline	Unexplained mortality of young Huon Pine in some remote riverine stands in WHA. Cause unknown.				

### 3(a) Vertebrate pests in native forests

	2001-2	2002-3	2003-4	2004-5	2005-6
Native forest			Of the 2001-02 age-class on State forest, 57% and 13% of clearfall / burn / sow and variable retention coupes, respectively, required control operations.		

## APPENDIX 6.3a Reservation of high quality wilderness

High Quality Wilderness Area	Total wilderness area (ha)	1996			2001			2006			Increase since 1996 (ha & %)	Increase since 2001 (ha & %)
		Formal reserves (ha)	Informal & private reserves (ha)	Total reserved (ha) & (%)	Formal reserves (ha)	Informal & private reserves (ha)	Total reserved (ha) & (%)	Formal reserves (ha)	Informal & private reserves (ha)	Total reserved (ha & %)		
Ben Lomond	10 300	9 800	0	9 800 (95%)	9 800	0	9 800 (95%)	9 800	0	9 800 (95%)	0	0
Cradle - Central Plateau	376 100	311 200	27 700	338 900 (90%)	370 500	1 500	372 000 (99%)	370 500	1 900	372 400 (99%)	33 500 (9%)	400 (0%)
Donaldson	53 200	0	5 100	5 100 (10%)	25 400	1 700	27 100 (51%)	25 400	21 300	46 700 (88%)	41 600 (78%)	19 600 (37%)
Douglas Apsley	10 100	10 000	0	10 000 (99%)	10 000	0	10 000 (99%)	10 000	0	10 000 (99%)	0	0
Freycinet	8 500	8 500	0	8 500 (100%)	8 500	0	8 500 (100%)	8 500	0	8 500 (100%)	0	0
Henty	24,000	300	1 500	1 800 (8%)	23 600	0	23 600 (99%)	23 600	0	23 600 (99%)	21 800 (91%)	0
Little Henty	9 100	300	400	700 (8%)	300	400	700 (8%)	300	4 400	4 700 (52%)	4 000 (44%)	4 000 (44%)
Maria	8 500	8 500	0	8 500 (100%)	8 500	0	8 500 (100%)	8 500	0	8 500 (100%)	0	0
Meredith Range	63 400	700	14 500	15 200 (24%)	59 000	400	59 400 (94%)	59 100	1 500	60 600 (95%)	45 400 (71%)	1 200 (1%)
Mt Field	15 400	11 200	2400	13 600 (88%)	11 200	2 400	13 600 (88%)	11 200	2 600	13 800 (90%)	200 (2%)	200 (2%)
Mt Heemskirk	10 900	0	0	0%	9 900	0	9 900 (91%)	9 900	300	10 200 (94%)	10 200 (94%)	300 (3%)
Mt William	7 700	7 200	0	7 200 (93%)	7 200	0	7 200 (93%)	7 200	0	7 200 (93%)	0	0
Norfolk Range	92 300	1 100	79 300	80 100 (87%)	89 800	200	90 000 (98%)	90 000	1 200	91 200 (99%)	10 800 (12%)	1 200 (1%)
Savage	51 600	0	32 200	32 200 (62%)	32 800	2 200	35 000 (68%)	32 800	16 500	49 300 (95%)	17 100 (33%)	14 300 (27%)

High Quality Wilderness Area	Total wilderness area (ha)	1996			2001			2006			Increase since 1996 (ha & %)	Increase since 2001 (ha & %)
		Formal reserves (ha)	Informal & private reserves (ha)	Total reserved (ha) & (%)	Formal reserves (ha)	Informal & private reserves (ha)	Total reserved (ha) & (%)	Formal reserves (ha)	Informal & private reserves (ha)	Total reserved (ha & %)		
South West	1 182 300	964 600	152 500	1 117 100 (94%)	1 139 400	10 600	1 150 000 (97%)	1 139 000	13 900	1 152 900 (98%)	35 800 (4%)	2 900 (1%)
Sumac	14, 000	9 200	1 600	10 800 (77%)	10 800	200	11 000 (78%)	10 800	500	11 300 (80%)	500 (3%)	300 (2%)
<b>Total HQ Wilderness</b>	<b>1 937 900</b>	<b>1 342 500</b>	<b>317 100</b>	<b>1 659 600 (86%)</b>	<b>1 816 700</b>	<b>19 600</b>	<b>1 836 300<sup>4</sup> (95%)</b>	<b>1 816 500</b>	<b>64 300</b>	<b>1 880 800 (97%)</b>	<b>221 200 (11%)</b>	<b>44 500 (2%)</b>

Notes:

1. The extent of some wilderness areas published in the 1996 CRA and 1997 RFA included areas of sea (eg Bathurst Harbour); these are excluded in the above table.
2. Areas are rounded to the nearest 100ha to reflect the spatial resolution of the wilderness mapping, which was based on 1km x 1km units.
3. The 2006 reserve data is as-at 30 June 2006. Some formal reserves created through the TCFA process had not yet been gazetted and were included as informal reserves in these figures.
4. The figure for the total reserved area of High Quality Wilderness in 2001 was incorrectly quoted in Table 6.2a of the report, *Sustainability Indicators for Tasmanian Forests 1996 – 2001* as the total (1,937,900 ha). It should have read 1,836,300 ha. The percentage figure in the previous report was correct (95%).

## **Appendix 7.1.b Community awareness**

### **Government systems**

#### **Department of Primary Industries and Water (DPIW)**

The activities of the DPIW underpin many of the actions taken across the government and private sectors, supporting the State's growth as a competitive place to do business and to invest in, while helping maintain the unique lifestyle of Tasmania's people. The Department is the Government's primary interface with rural and regional communities.

DPIW actively fosters and builds partnerships with the community, industry and the different tiers of government. A number of awareness and skill development training courses were delivered for regional and local Natural Resource Management (NRM) facilitators, including cultural awareness and Aboriginal engagement, facilitation, and community-based social marketing.

A number of initiatives have been undertaken to raise community awareness of:

- Water Planning and Management.
- Living Environment Program
- LIST Strategic Directions Project
- Natural Resource Management
- Wildlife management
- Product integrity

#### **Forestry Tasmania**

Forestry Tasmania mission statement is "the sustainable production and delivery of forest goods and services for optimum community benefit" which is achieved by fostering public support through community sponsorship and development programs.

Forestry Tasmania funds Community Liaison Officers who are an important public point of contact and information on forestry matters and the local projects Forestry Tasmania supports. Across the state, Forestry Tasmania has helped local communities develop walking tracks and picnic areas. Partnerships such as these provide a sense of ownership of the local forest areas around the State.

The Forestry Tasmania Board continued to support, through resource allocations, the community service projects that have become a hallmark of the organisation's input in regional areas. While these allocations fell from \$5.6 million in 2004-05 to \$4.8 million in this financial year, they remain a significant expenditure outside of State government funding that other equivalent public forest land management businesses receive. Twenty four organisations were sponsored by way of financial support for regional events such as sporting activities, art, theatre and cultural activities.

Forestry Tasmania has signed a number of Community Forest Agreements with business, community and tourism/recreational organisations with an interest in forest management and forest use.

Research and development activities are continue to focus on meeting organisational and community objectives across three main areas, managed by three Branches within the Division: Biology and Conservation, Native Forests, and Plantations. All programs are formally reviewed every year in consultation with stakeholders and the work provides the following key outputs for Forestry Tasmania.

#### **Private Forests Tasmania (PFT)**

The objectives of PFT as set out in the *Private Forests Act 1994* include “to foster the use and values of trees in sustainable land management”. As in past years, this environmental objective remained a significant aspect of PFT’s work.

To achieve this, PFT’s strategic plan commits to greater consultation with a broad range of stakeholders in private forestry, with a special emphasis on consulting with the wider community; and undertaking (or where appropriate, foster) targeted research that enhances understanding of the private forestry sector by governments and the community,

#### **Department Arts, Tourism and Environment (DTAE)**

DTAE mission statement commits it to using it’s collective advantages and expertise to manage and promote Tasmania’s world class natural and cultural assets and activities to enhance the states economic, social and cultural environment which will be achieved by working together to:

- deliver attractions and experiences that reflect the unique qualities of the natural and cultural assets of our State;
- continually enhance and improve our facilities, services and programs; and
- engage the community through partnerships and collaborations.

DTAE manage the Tasmanian Wilderness World Heritage Area which is one of the largest conservation reserves in Australia (1.38 million hectares) and covers approximately 20 per cent of the land area of Tasmania, being one of only three temperate wilderness areas remaining in the Southern Hemisphere.

The key objective of DTAE’s Parks and Wildlife Service is to create and maintain a representative and world renowned reserve system that achieves the principal goal of conserving the State’s natural and cultural heritage while providing for sustainable use and economic opportunities for the Tasmanian community.

The Parks and Wildlife Service *Strategic Plan 2006-08* was developed in February 2006 to provide a the framework to enable the Parks and Wildlife Service to respond more effectively to the community’s needs and aspirations for the reserve system.

## Appendix 7.1.d Sustainability measuring and monitoring programs

SFM Criterion	Type of Program	Program name	Lead agency	Description
Biological Diversity	Measure	TASVEG	Department of Primary Industries and Water (DPIW)	Vegetation mapping at 1:25 000 and supporting database which provides an improved basis for monitoring, with finer spatial resolution.
		NRM programs	DPIW	TASVEG Vegetation Condition Assessment is a site based vegetation monitoring program being implemented with assistance of DPIW
	Monitor	Monitoring Vegetation Extent Project	DPIW	Assessment and implementation of methodologies for monitoring of vegetation type, extent, and distribution
		Forest operation mapping	Forestry Tasmania (FT) and Private Forests Tasmania (PFT)	Forestry Tasmania maps annual changes on public land which identifies changes that are used to update RFA forest community and old growth mapping. PFT collates major forest changes on private land from information obtained from private commercial forest managers, satellite imagery and field work
		Fauna and flora population level survey	DPIW	Population levels of threatened species, species of conservation significance and some endemics are monitored periodically by the DPIW. Recovery Plans for some species require ongoing population surveys.
Productive capacity of forest	Measure	National Plantation Inventory	PFT and FT	Survey the extent of plantation forest estate across all tenures.

<b>SFM Criterion</b>	<b>Type of Program</b>	<b>Program name</b>	<b>Lead agency</b>	<b>Description</b>
ecosystems		Timber inventory	FT and larger private commercial forest managers	Randomly sampled inventory plots are measured across forest estates and the results are used as the basis for calculating planned yields.
	Monitor	Certificate of Compliance	Forest Practices Authority (FPA)	The achievement of reforestation standards, including stocking, is self-monitored and supported by lodgement of a certificate of compliance after each discrete operational phase within a Forest Practices Plan
		Operational standards	FT and larger private commercial forest managers	To ensure that forest operations such as planting, pruning, and harvesting meet acceptable standards, FT and major private industrial companies routinely undertake quality-assurance audits and assessments
		Forest practices planning	FPA	15% audit of forest practices plans and their implementation
Ecosystem health and vitality	Monitor	Permanent Native Forest Estate	FPA	Monitors areas of native forests that will be maintained above minimal levels, expressed as a percentage of the native forest estate assessed in 1996 under the RFA
	Measure and monitor	Systematic forest health surveys	FT and larger private commercial forest managers	Identifies the need for remedial treatments such as pest management, application of fertiliser, and silvicultural operations
Soil and Water resources	Measure	Soil profile program	FPA and DPIW	Develop whole of State forest soil information based on description of 32 soil profiles.
	Monitor	Warra Long Term Ecological Research site	FT	Soils, biodiversity, hydrology and their interactions are being monitored to establish baseline measurements and evaluate the impact of forest practices.

<b>SFM Criterion</b>	<b>Type of Program</b>	<b>Program name</b>	<b>Lead agency</b>	<b>Description</b>
Carbon cycle	Measure and monitor	National Carbon Accounting System	Australian Greenhouse Office (Cwth)	In conjunction with Tasmanian agencies, continues to refine systems which measure and monitor inventories of forest biomass.
		Warra Long Term Ecological Research Site	DTAE and FT	Assessing the scientific values of Tasmanian forests through dendrochronology of long-lived trees to monitor climate change.
Socio-economic benefits	Monitor	Tourism visitor number surveys	PWS and FT	Routine of visitor numbers to selected reserves and facilities
Legal institutions	Monitor	State of the Forests reporting	FPA	Report each 5 years on the status of, and changes to, Tasmania's forests across all tenure
	Monitor	State of the Environment reporting	Resource Planning and Development Commission (RPDC)	Reports each 5 years on the condition of the environment; trends and changes in the environment; the achievement of resource management objectives; and recommendations for action to be taken in relation to the management of the environment.
	Monitor	<i>TasTogether</i> reporting	Department of Premier and Cabinet	Regular monitoring of achievements against <i>TasTogether</i> goals
	Measure and monitor	State of the TWWHA Report	DTAE	Reports on evaluation of management effectiveness under the management plan