



# Research and Advisory Program Annual Report 2008–09



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A summary of this report was included in the Forest Practices Authority's Annual Report 2008–09, which is available on the website <[www.fpa.tas.gov.au](http://www.fpa.tas.gov.au)>.

# 1 The Research and Advisory Program

The Research and Advisory Program of the Forest Practices Authority (FPA) employs specialists in botany, cultural heritage, geoscience, soil and water, visual landscape and zoology. Research and monitoring in these subjects underpins the *Forest Practices Code* and aid its development. The specialists play a key role in the forest practices system. Services provided by the specialists include the following:

- Training, education and liaison with Forest Practices Officers (FPOs) and land managers.
- Ongoing development of a variety of management tools to assist FPOs in preparing Forest Practices Plans (FPPs). These include the Threatened Fauna Adviser, a computer program designed to help FPOs, forest planners and consultants find the appropriate agreed prescriptions for threatened fauna when preparing their FPPs.
- Developing and maintaining up-to-date manuals to document the knowledge that underpins the *Forest Practices Code* and to provide additional guidelines for the practical management of specific values within wood production forests.
- Providing FPOs and land managers with practical specialist advice on identifying and managing the natural and cultural values of forests. This is normally in response to a notification as part of the forest practices planning system.
- Conducting surveys that require special expertise.
- Contributing to comprehensive and scientifically based inventories and databases and the updating of these databases through additional research and surveys. Such databases show the occurrence or potential occurrence of values that may require reservation or special management.
- Undertaking research to test the effectiveness of the provisions of the *Forest Practices Code* and proposing amendments if necessary.
- Monitoring the implementation of the *Forest Practices Code* and management prescriptions involving specific values. The specialists work closely with other scientists and professionals in other agencies involved in implementing the forest practices system, such as the Nature Conservation Branch of the Department of Primary Industries, Parks, Water and Environment (DPIPWE), Forestry Tasmania, forest companies, various CSIRO research divisions, other government departments and universities.

Cover picture: One of the roles of the research and advisory programs is to develop planning tools which assist Forest Practices Officers in preparing Forest Practices Plans. In May 2009, the FPA organised a training day to familiarise Forest Practices Officers with a new map illustrating potential habitat suitability for the threatened giant freshwater crayfish. In the photograph, Peter Davies (right), an FPA board member and a freshwater ecologist, discusses the characteristics of good giant freshwater crayfish habitat with participants on the training day.

## 2 Biodiversity Program

### 2.1 Personnel

Table 1 Staff employed in the Biodiversity Program 2008–09

Name (Main activity program*)	Position	Dates (if not for whole year)	Part-time/contract
Fred Duncan (P A)	Manager		
Karen Richards (A)	Ecologist		
Anne Chuter (A R)	Ecologist		
Adam Pennington (A)	Ecologist		Contract arrangements
Tim Leaman (A)	Ecologist		
Nina Roberts (T)	Scientific Officer	June – Sept 2008 Feb– June 2009	Part-time (1 day/wk)
Sarah Munks (P R)	Senior Research Biologist and FPA research co-ordinator		Part-time (4 days/wk)
Chris Spencer (R)	Technical Officer (R & M) and FPA OH&S officer		
Amy Koch (R)	Project Officer (Tree hollows)		Contract (fixed term)
Jason Wiersma (A R)	Project Officer (Eagles)		80% External funding
Lisa Cawthen (R)	Project Officer (Value of retained trees)	June – Dec 2008	Contract (fixed term)

\* Main activity programs within the Biodiversity Program:

A – Advisory; P – Policy; R – Research and Monitoring; T – Tree Fern Management;  
The Senior Research Biologist is responsible for managing Research and Monitoring staff.

### 2.2 Notifications, advice and site visits

#### FPP notifications

The Biodiversity Advisory Program processed approx 840 notifications for advice on flora and/or fauna issues – this includes about 50 notifications left over from the 2007–08 reporting period (but does not include a similar number of notifications that were received in 2008–09, but which were not finalised in this reporting period.) The staff of the Biodiversity Program contributed to field assessments and provision of advice. Notification figures were less than those for the 2007–08 reporting period (887).

**Table 2: Biodiversity Program notifications in 2008–09**

	State forest	Private forest	Total
Office assessment and advice provided (approx)	332	377	709
Field assessment and advice provided (approx)	34	94	128
<b>Total notifications</b>	<b>366</b>	<b>471</b>	<b>837</b>

Draft advice provided by FPOs was accepted in 60–70% of operations. Such advice was generally consistent with that indicated in biodiversity planning tools, notably the *Forest Botany Manual*, the Threatened Fauna Adviser and Technical Notes. Most notifications requiring additional advice were for threatened fauna species (e.g. central-north burrowing crayfish and swift parrot) that are not adequately covered by the Threatened Fauna Adviser (currently being reviewed) or other planning tools – some management issues relating to these species are being addressed by strategic planning and research. Other significant advice requirements related to eagle management and threatened forest and non-forest communities.

Biodiversity Program staff conducted field assessments on about 15% of referred sites. Some areas needed more than one assessment or assessments by more than one staff member, generally in response to a range of biodiversity issues (flora, fauna or vegetation communities). Areas needing complex assessments and advice for forestry-related issues included southern forests, Tasman and Forestier Peninsulas, the Northwest and Central Highlands (eastern part). On State forest, most notifications dealt with native forest harvesting. A high proportion of notifications on private land (particularly those requiring complex advice) were for conversion of native forest to plantation or agricultural land.

About 4% of notifications were for residential clearing (mainly subdivisions), construction of non-forestry infrastructure (dams, roadlines, quarries) and mining activities – in many cases notifications were accompanied by environmental assessments by consultants. Many of these notifications had complex fauna, flora and community issues which required liaison with DPIPWE and other agencies. In about 10 cases, FPA needed to develop off-sets for loss of biodiversity values – this usually required high allocations of time by Biodiversity Program staff. There were numerous other referrals or queries about small-scale non-forestry clearing, which required consideration by Biodiversity Program staff, but which did not require preparation of FPPs.

Field visits by FPA staff resulted in many new records of threatened flora and fauna, and increases in knowledge of the ranges and habitats of some threatened species – such information was provided to DPIPWE and Forestry Tasmania for incorporation into databases. Threatened fauna species range maps were also refined. Management of wedge-tailed eagle nest searches and nest activity checking, as well as liaison with DPIPWE specialists, took a significant amount of the Advisory Program's resources, with 87 new nests recorded in the 2008–09 period.

FPA Biodiversity Program staff formally consulted on threatened species prescriptions with specialist staff of DPIPW (mainly Threatened Species Section) on 95 occasions, and with staff of Inland Fisheries Service on three occasions. Some of these consultations involved more than one coupe and/or more than one threatened species. Species which were the subject of frequent consultations included: swift parrot, galaxias species and central north burrowing crayfish (fauna) and *Xanthorrhoea* species, *Pimelea curviflora* and *Hypoxis vaginata* (flora). Adoption of streamlined procedures for some 'common' threatened plant species reduced requirements for formal consultations. Processes to provide better and more timely information to DPIPW (for incorporation into Natural Values Atlas) have also been developed.

Turn-around time for forestry-related notifications was generally less than in 2007–08. Turn-around time was still high (> 2 months) for some complex FPPs (mainly on private land), and for some FPPs for coupes which required strategic planning approaches (e.g. swift parrot management in the southern forests and south-eastern Tasmania). An improved tracking and databasing system was developed for Biodiversity Program notifications.

### ***Other advisory issues***

Biodiversity Program staff assisted with investigations or other compliance advice for about 25 operations (mainly related to threatened species or communities) – many investigations required field visits.

Staff also provided ministerial advice, and information in connection with FOI requests.

Biodiversity Program staff provided evidence to four Forest Practices Tribunal hearings in 2008–09. The biodiversity issues dealt with were swift parrot habitat; conversion of threatened forest and non-forest communities; and conversion of native vegetation on King Island. Information was also provided for three hearings to be conducted in the 2009–2010 reporting period. An increase in the number of appeals because of refusal of FPPs due to the presence of threatened species or communities is anticipated.

## **2.3 Training and education**

### ***Training and information received***

- 3 day course on the use of the statistical analysis package R – attended by research staff
- partial harvesting field day on Central Highlands – attended by several Biodiversity Program staff
- writing course (Eagle Project Officer)
- radio-telemetry course at Antarctic Division (Eagle Project Officer).

### ***Training information and extension provided (also see publications list)***

The following training courses, field days and other extension activities were organised and conducted by Biodiversity Program staff:

- field day to introduce FPOs/planners to the giant freshwater crayfish Potential Habitat Map
- field days (x2) to assess management of swift parrot habitat with the Fauna Strategic Planning Group
- field days on swift parrot identification and habitat management for FPOs/planners
- field days (x3) on threatened butterfly identification and habitat management for FPOs/planners and natural resource managers
- eagle habitat identification and nest management course (1 day theory; 3 field days)
- field days (x3) on threatened butterfly identification and habitat management for FPOs/planners and natural resource managers
- presentations on Tasmania's biodiversity and forest practices system at several venues, including: University of Tasmania (Dept of Geography and Environmental Science; Dept of Zoology)
- presentation at Australian Mammal Society conference on use of trees retained in partial harvest areas by fauna (Lisa Cawthen)
- contributed to DPIPWE Climate Change conference and workshop (Sarah Munks)
- attendance at CSIRO workshop on Impacts of climate change on the national reserve system: Southeast Australia sclerophyll forests (Fred Duncan)
- attendance at CRC for Forestry annual meeting in Launceston at the end of 2008
- contribution to TLC workshop on connectivity and Threatened Species Prioritisation Project by Threatened Species Section
- input into major review of the operation of the EPBC Act
- preparation of several articles for *Forest Practices News* and CRC newsletter (Biobuzz)
- other liaison with scientists, industry, public and various interested parties.

### ***Review of FPA training requirements and accreditation***

Biodiversity Program staff contributed to the current review of FPO training and accreditation requirements and developed assessments and course material for the 2009 FPO training course.

## 2.4 Planning tools and guideline development

Biodiversity related planning tools and guidelines continued to be developed and updated. The following major actions were initiated or continued in 2008–09:

### Biodiversity Evaluation Sheets

The Biodiversity Evaluation Sheet was revised, combining the current Flora and Fauna Evaluation Sheets. A draft version has been released for comments; it is anticipated that this will be released for general use by FPOs in September 2009.

### Review of the Threatened Fauna Adviser (TFA)

This review is co-ordinated by the Senior Research Biologist. The Project Steering Committee (PSC) (members from FPA and TSS) worked with the consultants throughout the year on the development of the review process, purchasing the updated Expert System software and reviewing species information and decision pathways.

In addition to the updated web-based decision support program, three reports will be produced as part of this review. The first which covers the history of the Threatened Fauna Adviser, the review process and the species list is now available on the FPA web page (Wapstra and Doran, 2008). The second is a working draft and covers the review of new information on species and the draft decision pathways. The third will be supporting notes and guidelines for the users of the Threatened Fauna Adviser.

The review was delayed in 2008–09 due to a number of unforeseen difficulties including delays in securing the software, organising species workshops with the specialists and other demands on PSC members' time. However, the review is back on track and a working draft of the revised TFA should be ready for comment from practitioners, the Forest Practices Advisory Council and the Threatened Species Scientific Advisory Committee, as part of the adoption process, in September 2009.

### Fauna Values Database

There has been ongoing maintenance of threatened fauna locality data and range boundaries available via the Fauna Values Database (FVD) for planners. In particular, the swift parrot known nest data and range maps, threatened fish locality data and wedge-tailed eagle nest database have been updated. Updating of this information has been done with the help of the FPA GIS and database support officer.

The giant freshwater crayfish potential habitat suitability map was developed in collaboration with researchers from Freshwater Systems and endorsed for use by the Threatened Species Scientific Advisory Committee and FPAC. It was added to the FVD in 2008–09 for use by planners.

### Planning Guidelines

Two documents to take into account biodiversity requirements during the planning of activities covered by the forest practices system were produced in 2008–09.

The first entitled, *'An internal planning framework developed by the FPA for the purposes of delivering management prescriptions to avoid or limit the clearance and conversion of significant habitat for threatened forest fauna'*, was released in September 2008. This document provides a planning framework to avoid or limit the clearance and

conversion of significant habitat of threatened fauna habitat to non-native vegetation cover such as plantations, agriculture and infrastructure.

The second entitled, '*Interim Species Habitat Planning Guideline for the conservation management of Lathamus discolor (swift parrot) in areas regulated under the Tasmanian forest practices system*', was produced in consultation with a strategic planning group of experts and practitioners in June 2009. The purpose of this planning guideline is to deliver management prescriptions via the Agreed Procedures for the management of habitat this species.

### **Biodiversity Technical Notes and Field guides (see FPA website)**

#### **Field guides prepared:**

*Field guide for forest planners/contractors on identification and management of hollow-bearing trees of use to fauna.*

Comments from practitioners were sought on this guide in 2008–09 and it has been revised and should be released in November 2009. Funding was obtained from the CRC Forestry for its production as a field booklet.

#### **Technical notes completed or reviewed:**

*Assessing juvenile giant freshwater crayfish habitat in class 4 streams* – this technical note was drafted in 2008–09 to help planners with decisions on how to use the potential habitat suitability map when making decisions on management actions for class 4 streams.

*Eagle nest searching, activity checking and nest management* – this technical note was revised taking into account the outcomes of the first year of the Eagle Nest Monitoring project.

*Management of Tree Hollows* – work on this technical note continued in 2008–09.

## **2.5 Policy, reviews and management issues**

Staff in the Biodiversity Program contributed to strategic planning and development of biodiversity-related policy, often as members of collaborative groups. The Senior Research Biologist coordinated the strategic planning and review activities in 2008–09, including the review of the biodiversity provisions of the *Forest Practices Code*.

### **Review of the biodiversity provisions of the *Forest Practices Code***

This major review was completed in April 2009. The final report (Biodiversity Review Panel, 2008) and associated background reports are available via the FPA web page. The panel's review found that the Tasmanian forest practices system provides the basis for an effective framework for ensuring that forest practices are consistent with the delivery of sustainable management from the perspective of biodiversity conservation. The panel made 41 key recommendations for the improvement of the system in their report to the board of the Forest Practices Authority. These recommendations ranged from broad recommendations for the improvement of policy and processes through to more specific recommendations relating to the biodiversity provisions of the code and planning tools. Two of the main areas that the panel felt required further consideration were strategic planning for biodiversity and the development of measurable objectives for biodiversity

conservation in areas covered by the forest practices system. The biodiversity review report is currently being used in the current review of the *Forest Practices Code*.

### **Strategic planning for fauna species and issues**

The development of strategic planning approaches to cater for threatened fauna species continued to be a focus for Biodiversity Program staff. Relevant staff of DPIPWE, Forestry Tasmania, Inland Fisheries Service, forest industry representatives and researchers are also involved in fauna strategic planning groups.

- Fauna Strategic Planning Group: in 2008–09 this group concentrated on the development of a Habitat Planning Guideline for the swift parrot. This guideline is designed to help those making decisions on the management of habitat for this species in areas covered by the forest practices system. It is also being used to inform the revision of the Threatened Fauna Adviser.
- Swift parrot strategic plan: the Senior Research Biologist contributed to a funding proposal by FPA and DPIPWE to the Commonwealth for the development of a strategic plan for the swift parrot.
- FPA supported DPIPWE project to assess swift parrot use of Wielangta in 2007–08 breeding season.
- Wedge-tailed eagle: results of the FPA/DPIPWE wedge-tailed eagle monitoring project were used to revise protocols for the management of habitat for this species.
- Membership of Threatened Fish Recovery Team dealing with threatened fauna species.

### **Strategic planning for flora species and vegetation**

Biodiversity Program staff contributed to the following activities:

- tree fern management: reporting to Australian government (DEWHA) under requirements of Tasmania's Tree Fern Management Plan
- threatened flora species: liaising with DPIPWE and specialists about conservation status and management of flora species
- vegetation communities: contributing to DPIPWE review of status of lowland grassland communities.

### **Permanent Forest Estate Policy and monitoring**

Biodiversity Program staff are responsible for analysing figures from FPA's FPP database, to estimate the extent of conversion of forest communities (based on 1996 benchmarks) and assess trends in conversion. Analyses are conducted at bioregional and state-wide levels, and results are given in FPA's annual report.

Analyses of 2008–09 figures indicate that approx 4.4% of the estimated 1996 state-wide native forest estate has been converted (as at 30 June 2009). Some non-threatened forest communities are approaching bioregional thresholds, and at a state-wide level, the 95% conversion limit is fast approaching.

A strategic approach is needed to ensure that future social, economic and environmental needs of the Tasmanian community are not jeopardised by an unconstrained approach to forest conversion over the next three years.

## 2.6 Research and monitoring

Although review work in the Biodiversity area was generally well funded in 2008–09 (e.g. biodiversity review of the *Forest Practices Code*, Threatened Fauna Adviser review), research and monitoring projects relied to a large extent on external funding.

Collaborative research was undertaken in 2008–09 with DPIPW (particularly the Threatened Species Section), Forestry Tasmania, University of Tasmania, CRC Forestry, Freshwater Systems and ECOtas (the last two are environmental consultancy firms). The FPA is a supporting partner of the CRC for Forestry, with many FPA Biodiversity Program staff contributing to CRC Biodiversity, Water and Landscape projects, particularly 4.2.5, 4.1.4 and 4.1.2, and deliverables (see Table 3). In 2008–09, staff contributed to the building of a landscape scenario for the 'Social acceptability of forest landscape management' project by Melbourne University.

Research and monitoring activities related to biodiversity were reviewed by the Expert Review Panel as part of the review of the biodiversity provisions of the *Forest Practices Code*. The panel endorsed the active research into biodiversity being undertaken by staff of the biodiversity program. However, they recommended that the FPA should actively seek to increase its capacity to address biodiversity-related issues especially to facilitate and assimilate relevant research. They also recommended that the FPA actively review and upgrade a systematic program of effectiveness monitoring for biodiversity conservation. The Senior Research Biologist commenced work on this recommendation in 2008–09.

Staff of the Biodiversity Program (particularly Senior Research Biologist) continued to attract and supervise higher degree and honours students. Projects undertaken by these students contributed to priority research areas determined by the FPA Research Working Group. Most of the student projects were affiliated with the CRC for Forestry sub-project 4.2.5 ('Management of species of high conservation significance'). Many were recipients of FPA's Student Research Fund (see Table 3).

Research and monitoring activities in 2008–09 focussed on projects that contributed to three main areas of priority for research identified by the FPA Research Working Group (Wapstra and Munks, 2008):

- distribution, ecology and impacts of forestry practices on flora and fauna species of high conservation significance (threatened and RFA priority species), and their habitats
- special values and management of mature forest habitat, in particular issues relating to retention of hollow resource for hollow users
- values and management of retained habitat (remnants, wildlife habitat strips, habitat clumps, streamside reserves, cultural heritage reserves, karst reserves).

The results from research studies were used to improve planning tools in 2008–09 (e.g. Tech Notes, Threatened Fauna Adviser and range maps) and to develop more strategic management plans and prescriptions for use by FPOs and forest planners.

The database of FPA Research and Monitoring projects and permanent research site locations was updated in 2008–09 and localities were added to the FPA GIS system and State Forest GIS (CONSERVE).

Other activities in the research and monitoring area included ethics and permit reporting requirements, project risk assessments, funding applications, annual reporting

requirements for the CRC for Forestry, attendance at the CRC Forestry Annual General Meeting in Launceston (Nov 08), co-ordination of the FPA Research Working Group and administration of the FPA Student Research Fund.

Theses and *Forest Practices News* articles were received from some 2006–07 and 2007–08 recipients of student research funding: Toby Smith, Michael Todd, Lynda Petherick and Erin Flynn. Funding recipients in 2008–09 were overseas MSc student Rachelle Olsson-Herrin (School of Zoology), PhD student Helen Stephens (CRC for Forestry and School of Botany), PhD student Shannon Troy (School of Zoology) and PhD student Jorge Rui De Carvalho Martins (School of Agricultural Science).

Specialist contract work, relating to eagle management, was carried out by the eagle Project Officer in 2008–09. Research staff provided technical assistance and training in their area of expertise to advisory staff and CRC/FPA-affiliated students throughout the year.

### Research projects

Table 3 summarises research and monitoring projects that involved Biodiversity Program staff in 2008–09, in many cases through co-supervision or support of students and collaborations with other researchers. Projects include several long-term research studies, some of which were funded externally (e.g. eagle project funded by Roaring 40s) and through the sale of tree fern tags (tree fern projects). Most projects contributed to the Water and Biodiversity Programs of the CRC for Forestry.

**Table 3 Biodiversity research projects that were active in 2008–09 reporting period, with summary of activities undertaken during this period.**

Project Title	Activities during period 01/07/08–30/06/09
Systematics and habitat preferences of threatened hydrobiid snails (Hydrobiidae: Beddomeia) in Tasmania	Data analysis and write-up continued as part of Karen Richards' PhD. Results have informed the revision of Threatened Fauna Adviser recommendations for the genus and headwater stream habitats.
Relating forest management to stream ecosystem condition in middle and lower catchment reaches in Tasmania	A total of 32 sites were sampled by consultant from the initial site selection for the north and north-west. Data analysis underway. Technical Officer sorted macroinvertebrate samples. Preliminary study paper now published. Additional funding obtained from CRC for forestry.
Recovery of headwater streams after current <i>Forest Practices Code</i> Logging – Warra sites	Sampling continued in 2008–09 by consultant. PhD student Ryan Burrows supported by FPA Technical Officer. Meeting with Huon District to discuss harvest plans.
Effect of disturbance on habitat, population structure and physiology of the common brushtail possum	Fieldwork completed by PhD student Erin Flynn with assistance from FPA Technical Officer. Sample analysis continuing. A poster prepared for the CRC Annual Meeting.
Implementation of fauna provisions of Tasmania's <i>Forest Practices Code</i> : before and after improvements to process and prescriptions	Planning assessments for Bass District and private coupes in Derwent District continued and field assessments continued. Data entry up to date. Delay in field assessments due to other work commitments continued in 2008–09.
Implementation and survival of wildlife habitat clumps	Control clumps established and data analysis and write-up has started.
Mapping hollow availability	The Hollows Project Officer collaborated with researchers from Forestry Tasmania to test whether aerial photographs can be used to assess hollow availability. Surveys were conducted and the results indicate that assessing mature crown density and crown senescence from aerial photographs explains about half of the variability in hollow-bearing tree density. It is anticipated that mapping layers developed from this

	assessment can be used to manage the hollow resource at the landscape scale. A paper has been prepared from this work.
Value of habitat retained in forestry coupes for hollow using fauna	Sites established and radio-tracking completed for study looking at the use of trees retained in wildlife habitat clumps in partial harvest areas by brushtail possums. Temperature dataloggers deployed in habitat clumps and 'control' sites to monitor hollow occupancy. Sites established and bird surveys completed for project monitoring habitat trees retained in plantations. Control sites established in agricultural areas. Pygmy possum nest boxes checked, with use recorded in 3 out of the 28 boxes established in dry forest sites (one control and two in habitat clump). Invertebrate samples from tree hollow surveys sorted and identified by Tech Officer. Write-up and preparation of three papers from the study (see publications). Funding application to Caring for Country, Wettenhall foundation, Hermon Slade grant and WVScott completed.
How effective are the current management actions in protecting wedge-tailed eagle nest sites in production forests?	Report completed for 2007–08 surveys of 84 nests. Surveys for 2008–09 completed and ground surveys continued. Additional sites selected for 2009–10 surveys and funding obtained from Roaring 40s. Results so far are being used to inform the revision of planning tools for the management of wedge-tailed eagle habitat.
Simons stag beetle – long term monitoring of impact of CBS and thinning	Data analysis and write-up ongoing. Vegetation surveys completed in 2008–09.
Investigating the emergence and longevity of <i>Hoplogonus simsoni</i> in plantation and native forest	Surveys continued in 2008–09. Final report due in 2009–10.
Habitat use, breeding and feeding ecology of the Tasmanian masked owl, <i>Tyto novaehollandiae castanops</i>	Mick Todd (PhD student) completed survey of 300 sites for masked owls using spotlighting and call-back methods. With support from FPA Technical Officer and Eagle Project Officer, two owls were caught and radiotracked in 2008–09. (Student received FPA student grant and in-kind support in 2007–08).
Investigating the impact of superb lyrebird (which was introduced into Tasmania) on Tasmanian forest ecosystems	FPA continued to provided GIS and flora survey support for this CRC affiliated (sub-project 4.2.5) PhD student project in 2008–09.
Distribution, population structure and condition of the platypus within the Plenty River catchment	MSc student project by Rachelle Ollson-Herrin (Dept of Zoology, Univ. of Tas) completed June 2008. (Student received FPA student grant and in-kind support in 2008–09)
Contribution of forest remnants to the persistence of insectivorous bats in the landscape: local and landscape factors that affect their use	PhD project by Lisa Cawthen (CRC for Forestry) started in March 2009. Aim of study is to investigate how bats use different types and sizes of forest remnants at the local scale, and determine how the amount of forest habitat at the landscape scale affects bat remnant use, community composition and demographics. Site selection has started with assistance of FT and FPA GIS Officer.
Survival and salvage of <i>Dicksonia antarctica</i> in wet forest following intensive logging and regeneration to native forest	Field work completed following (attempted) regeneration burns in Florentine Valley coupe (CBS); Ben Nevis coupe (cable harvesting) and Styx Valley (aggregated retention)]. Survival rates of tree ferns in the burnt coupes appears low. Data entered for analysis but time constraints meant that analysis was not completed in 2008–09.
Edge effects on abundance and health of tree fern epiphytes in an aggregate retention coupe	CSIRO Student Research Scheme project (college student) – report completed
Effectiveness of wildlife habitat strips in maintaining vegetation structure and composition in wet eucalypt forest	Final analysis of results from experimental and control sites in <i>E. delegatensis</i> forest to be undertaken in 2009–10.
Ecology, habitat and population dynamics of <i>Prasophyllum stellatum</i>	Joint project with ECOtas and DPIPW. Sampling of sites in logged coupes at Storys Creek and Cluan Tier (support from FT and Gunns).

Effect of logging on population of <i>Pterostylis atriola</i> (a Greenhood orchid) in the Railton area	Plots established in operational and control areas in State forest coupe BG034A to assess effect of operation on this endangered species – logging completed – to be monitored in summer 2010.
Re-establishment of native grassland on <i>Pinus radiata</i> plantation site (Gunns, Surrey Hills)	Resampling of transects (established 2000) completed – native grassland has re-established on the ex-plantation sites, with species composition similar to adjacent native grassland. Results presented at International Grassland Conference (China).
Monitoring the implementation and effectiveness of <i>Phytophthora cinnamomi</i> prescriptions in State forest in Bass and Mersey districts – Pilot Study	Project developed. Sites will be selected in September; initial focus will be on road construction through PC sensitive areas.

## 2.7 Publications

### Published journal papers

(Staff or associates of the FPA are indicated in bold type.)

**Cawthen, L, Munks, S**, Richardon, A and Nicol, SC 2009, 'The use of temperature loggers to monitor tree hollow use by mammals', *Ecological Management and Restoration* 10 (2), 155–157.

**Koch, AJ, Munks, SA** and Driscoll DA 2008, 'The use of hollow-bearing trees by vertebrate fauna in wet and dry *Eucalyptus obliqua* forest, Tasmania', *Wildlife Research* 35: 727–746.

**Koch AJ**, Wapstra M, and **Munks, SA** 2009, 'Re-examining the use of retained trees for nesting birds in logged dry eucalypt forest in north-eastern Tasmania: 11 years on', *Tasmanian Bird Report* 33, 4–9.

**Koch, AJ, Munks, SA**, and Woehler, EJ 2009, 'Hollow-using vertebrate fauna of Tasmania: distribution, hollow requirements and conservation status. *Australian Journal of Zoology*', 56: 323–349.

**Munks, SA, Koch, AJ** and Wapstra, M 2009, 'From guiding principles for the conservation of forest biodiversity to on-ground practice: lessons from tree hollow management in Tasmania', *Forest Ecology and Management* 258: 516–524.

Smith, BJ, **Davies, PE** and **Munks, SA** 2009, 'Changes in benthic macroinvertebrate communities in upper catchment streams across a gradient of catchment forest operation history', *Forest Ecology and Management* 257: 2166–2174.

### Reports completed

Biodiversity Review Panel 2008, *Review of the biodiversity provisions of the Tasmanian Forest Practices Code*, unpublished report to the Forest Practices Authority, Hobart, Tasmania.

Wapstra, M and Doran, N 2009, *Review of Threatened Fauna Adviser Background Report 1: History of the Threatened Fauna Adviser, Overview of Review Process and Species List*, Forest Practices Authority, Hobart.

**Wiersma, J, Koch, AJ, Livingston, D, Brown, B, Spencer, C, Mooney, N and Munks, S** 2009, *Eagle Nest Monitoring Project – Year 1 2007–08, Establishing monitoring sites and investigating the relationship between nesting success of the Tasmanian wedge-tailed eagle and environmental variables, Forest Practices Authority Scientific Report 8*, report to Roaring 40s and the Forest Practices Authority.

### **Conference presentations, abstracts and posters**

**Cawthen, L, Munks, S** and Richardson, A 2008, 'The use of retained trees, in logged areas, by the common brushtail possum', paper presented at the Australian Mammal Society Conference, Darwin, Northern Territory, Australia, September 2008.

**Duncan, F, Gilfedder, L and Davey, C** 2008, 'Native grasslands in northwest Tasmania and the role of forest managers in their conservation and management', poster presented at joint International Grasslands Congress/International Rangelands Congress (IGC/IRC), Hohhot, China, June/July 2008.

**Flynn, EM, Jones, SM, Munks, SA** and Jones, ME 2008, 'Assessing the effect of habitat type and disturbance on population size and structure in the common brushtail possum (*Trichosurus vulpecula*) and other mammal species in production forests in Tasmania', poster presented at Australian Mammal Society Conference, Darwin, Northern Territory, Australia, September 2008.

**Flynn, EM, Jones, SM, Munks, SA** and Jones, ME 2008, 'Assessing the effects of habitat type on milk composition and physiological parameters in the common brushtail possum (*Trichosurus vulpecula*) in Tasmania's production forests', paper presented at Australian Mammal Society Conference, Darwin, Northern territory, Australia, September 2008.

**Flynn, EM, Jones, SM, Munks, SA, Jones, ME** 2008, 'Assessing the effect of habitat type and disturbance on population size and structure in the common brushtail possum (*Trichosurus vulpecula*) and other mammal species in production forests in Tasmania', poster presented at CRC Forestry Annual Meeting, Launceston, Tasmania, November 2008.

**Todd, MK** 2008, 'Ecology of the Tasmanian Masked Owl, *Tyto novaehollandiae castanops*', paper presented at the Australian Birdfair 2008, Leeton, NSW.

**Koch, AJ, Munks, SA** 2008, 'Managing hollow-bearing trees in Tasmania's production forests', poster presented at CRC Forestry Annual Meeting, Launceston, Tasmania, November 2008.

### **Theses submitted for projects supported or co-supervised by the FPA**

Olsson Herrin, R 2009, 'Distribution and individual characteristics of the platypus (*Ornithorhynchus anatinus*) in the Plenty River, Southeast Tasmania', B Sc/M Sc thesis, Lund University, Sweden.

## 3 Earth Sciences Program

### 3.1 Personnel

Table 1 Personnel

Name	Position	Dates (only if not for whole financial year)
Peter McIntosh	Senior Scientist, Earth Sciences	
Adrian Slee	Geoscientist	Commenced November 2008

### 3.2 Notifications, advice and site visits

Table 2 Soil and water notifications from State and private forest, 2008–09

	State forest	Private forest	Total
Office assessment and advice provided	123	112	235
Field assessment and advice provided	20	29	49
<b>Total notifications</b>	<b>143</b>	<b>141</b>	<b>284</b>

Table 3 Geoscience notifications from State and private forest, 2008–09

	State forest	Private forest	Total
Office assessment and advice provided	107	48	155
Field assessment and advice provided	27	18	45
<b>Total notifications</b>	<b>134</b>	<b>66</b>	<b>200</b>

The Earth Sciences Program responded to 487 notifications this year, compared to 572 last year (tables 2 and 3). There were 284 soil and water notifications requiring responses (369 last year) but about the same number of geoscience notifications (200 this year, 203 last year). The decrease in total responses is partly due to streamlining of the response process and coordination of replies: where possible both geoscience and

soil and water notifications were responded to by one specialist and not double counted.

Glacial and karst issues in the Mersey and Huon state forest districts were the main contributors to geoscience notifications in state forest. On private land the continued development of agricultural lands into plantations within the northern Tasmanian karst areas has been a consistent source of notifications. Three such coupes on private property required multiple visits due to complex karst issues. Soil and water notifications ranged in subject matter from stream erosion and soil erodibility to landslide management.

Six major investigations were made during the year, concerning (1) potential effects of a plantation on a town water supply; (2) risks to a domestic water intake; (3) risks to geomorphological features; (4) contamination of a farm water supply with herbicide; (5) monitoring cable harvest, and the effectiveness of the Strahan Guidelines on very high erodibility sand dunes in the Strahan area; and (6) updating geomorphic information in the Huon district.

Notifications take up about 50% of the total time of staff in the Earth Sciences program.

### **3.3 Training and education**

The Earth Sciences Program contributed to a soil and water course for forestry supervisors which held at Orford.

Field reconnaissance has been undertaken within the Huon and Florentine Valleys, and in the Zeehan district, to investigate possible research sites in glacial, alluvial and karst terrain and to establish field sites for a Forest Practices Officer course to be held at Maydena and a *Geology for Foresters* course to be held on the west coast.

Collaboration has also occurred with DPIPWE and UTas staff members on a number of karst-related issues, and on updating the Karst Atlas, which is used extensively for giving advice in karst terrain.

Training takes up about 10% of the time of the staff of the Earth Sciences program.

### **3.4 Planning tools and guideline development**

Research has been undertaken on karst management, with the aim of developing an effective management-oriented classification of sinkholes under various land uses, such as farmland, plantations, native forest. This research will assist in the revision of practical management guidelines for these important and vulnerable karst landforms. The research was mainly undertaken in the limestone areas of Mole Creek, Gunns Plains and the Florentine Valley, and in the dolomitic areas of the northwest.

Cable harvest operations on plantations on highly erodible steep dunesands on the west coast around Strahan have been reviewed, resulting in recommendations regarding harvest over streams, and minor amendments of the recommendations covering such operations.

### 3.5 Policy, reviews and management issues

During the year the Soil and Water and Geosciences Programs were amalgamated into the Earth Sciences Program in order to achieve efficiencies in responses to notifications and increase cooperation on research and monitoring.

Revisions were suggested concerning soil and water issues covered by the current *Forest Practices Code* review.

While visiting Canada, the Senior Scientist, Earth Sciences, met with foresters and forest scientists on Vancouver Island and in mainland British Columbia to compare the functioning of the Tasmanian and British Columbian forest practices systems.

### 3.6 Research and monitoring

A major research project on the erosion history of the Tasmanian forest estate was completed this year and resulted in two publications, one in the international journal *Quaternary Science Reviews* (McIntosh et al. 2009a). This paper shows that many erosion features on forested land relate to climates and surface processes in the Last Glacial period before 15 000 years ago. Such research has application when assessing risks in the forest estate: distinguishing relict (old) from active or dormant geomorphic features is important as most of the risk factors today are quite different from those that prevailed under the harsher climate of the Last Glacial period. The research also indicated that the arrival of people in Tasmania about 40 000 years ago is likely to have increased the erosion rate (by increasing fire frequency) and to have profoundly affected Tasmanian landscape stability and ecology.

The second paper (McIntosh et al. 2009b) incorporated new cosmogenic dates on bouldery deposits in doleritic terrain, obtained by ANU researcher Tim Barrows, and discussed the periglacial environment in Tasmania. It was presented at the Canadian Quaternary Association (CANQUA) conference in Vancouver, Canada.

An investigation was made with two independent researchers of unusual geological and mining markings on Blue Tier, northeast Tasmania. A preliminary report (McIntosh et al. 2008) was followed by a detailed paper which was submitted for publication to a peer-reviewed journal. The paper includes recommendations on management of the Blue Tier Forest Reserve.

A collaborative geochemistry project with the University of Queensland to characterise late Quaternary deposits exposed in a landslide in a plantation at Cygnet has been extended by bringing in a researcher from Melbourne University to date the deposits accurately using the optically stimulated luminescence technique. Quaternary dunesands in a plantation in northeast Tasmania were also sampled for dating by this method.

In another project with University of Queensland researchers, a student was given an FPA student grant to assist her investigation of the extent of vegetation changes that have occurred in the late Holocene (post-Glacial) period at east coast and west coast sites as a result of human influences (Petherick 2009).

Research takes up about 30% of the time of staff in the Earth Sciences Program.

## 3.7 Publications

### Published journal papers

Eberhard, R and **Slee, AJ** 2009, 'Do pine plantations have an impact on the density of brushtail possums in karst caves?', *ACKMA Journal* 74, 40–41.

**McIntosh PD**, Price DM, Eberhard R and **Slee AJ** 2009a, 'Late Quaternary erosion events in lowland and mid-altitude Tasmania in relation to climate change and first human arrival', *Quaternary Science Reviews* 28, 850–872.

### Reports completed

**McIntosh, PD**, Field, J and Dwyer, D 2008, *Surface weathering of granite in Blue Tier Forest Reserve – brief preliminary report*, Forest Practices Authority Report.

**Petherick, L** (2009) *Assessing the present land stability in the western Tasmanian forest estate in relation to recent and ancient human impacts*, report to the Forest Practices Authority, 5 p.

### Conference presentations, abstracts and posters

**McIntosh, PD**, Price, DM, **Slee, AJ**, Eberhard, R, Barrows, T and Bottrill, R 2009b, 'Periglacial and associated deposits of Tasmania: a review', *CANQUA-CGRG Biennial Meeting, Simon Fraser University, Burnaby Campus, Vancouver, Canada, 3–8 May 2009; Abstracts of presented papers*, p. 128.

## 3.8 Administration / Other

Administrative work done throughout the year included interviewing applicants for the new Geoscientist position; contributing to the *Forest Practices Code* review and attendance at meetings on the same; discussion on the new laboratory design and assisting with transfer of offices; presentations to the FPA Board on research funding; attending Water Quality meetings with DPIPW staff; assisting with editing of *Forest Practices News*; writing annual reports; attending Tasmanian Geoconservation Database meetings.

## 4 Heritage and Landscape Program: Cultural Heritage Section

### 4.1 Personnel

Table 1 Personnel names and dates

Name	Position	Dates (only if not for whole financial year)
Denise Gaughwin	Manager, Heritage and Landscape Program	
Darrell West	Senior Aboriginal Heritage Officer	Retired March 2009
Shamie Everett	Senior Aboriginal Heritage Officer	Commenced February 2009

### 4.2 Notifications, advice and site visits

Table 2 Cultural Heritage Section notifications from State and private forest, 2008–09

	State forest	Private forest	Total
Advice provided	216	267	483
Field assessment and advice provided	122	185	307
Total notifications	338	452	790

During 2008–09, 790 notifications were received involving cultural heritage issues. Of these notifications, 452 notifications and assessments were from private companies and 338 were from Forestry Tasmania. In comparison, 994 notifications involving cultural heritage issues were received in 2007–08.

Aboriginal heritage assessments continue to be a major part of the operational advice provided to the forest industry: Aboriginal heritage assessments accounted for 582 or 74% of the notifications whereas historic or overall assessments accounted for 208 or 26% of the notifications.

More Aboriginal heritage assessments were carried out for private forest industry (313) than for Forestry Tasmania (269). These surveys located 118 new Aboriginal sites on seventeen coupes. Most of these new Aboriginal sites (82 sites) were for isolated artefacts. The remaining 36 sites were artefact scatters, containing two to five pieces on average. Only two sites had more than ten artefacts.

The Senior Aboriginal Officer, Darrell West, has for many years made a significant contribution to the management of Aboriginal heritage in wood production forests.

Darrell had a serious illness and passed away shortly after his retirement this year. The FPA greatly appreciates the work Darrell has put into the forest practices system.

The level of request for Aboriginal assessments remains similar to previous years. This level cannot be sustained by the FPA alone. Although an additional Aboriginal Officer was appointed in February 2009, the Senior Aboriginal Heritage was on sick leave for some time before he retired, with the result that a large number of requests could not be met. It was necessary to undertake desk top assessments as the regrowth in a large number of coupes prevented a successful field survey. As a result, this year only 21% of assessments included a field survey, in contrast to previous years where the majority of assessments have involved a field trip.

A total of 43 new historic sites were located, recorded and assessed. These new sites have been entered on the historic sites Conserve data base managed by Forestry Tasmania. New sites include remote hut remains, timber tramways and sawmills as well as a coal-powered sawmill. Management prescriptions were prepared for these sites.

### **4.3 Training and education provided**

A Cultural Heritage component was presented to the Forest Practices Officer course covering historic and Aboriginal heritage identification and management.

Assistance was provided to the consultant preparing the new FPO course by preparing new course material and restructuring the existing course for cultural heritage. Attended the training course presented by Skills Tasmania on preparation and presentation for this course.

The Manager, Cultural Heritage presented a paper to the National Trust seminar series and the Kings Meadows Probus Club on Thomas Francis Meagher in Van Diemen's Land.

### **4.4 Planning tools and guideline development**

Preliminary work is underway with FPA landscape and soil scientists to develop a system for cultural and natural landscapes.

### **4.5 Policy, reviews and management issues**

The Cultural Heritage and Visual Management programs have been merged to form the Heritage and Landscape program.

The Cultural Heritage Section staff members have been involved with:

- the review of the *Aboriginal Relics Act 1975* through meetings, seminars and providing discussion papers
- a seminar on the review of the *Tasmanian Historic Heritage Act 1995* organised by Heritage Tasmania
- the Forum for Future Directions organised by Heritage Tasmania.

Liaison with all appropriate government agencies including Heritage Tasmania, Mineral Resources Tasmania, the Aboriginal Heritage Office, local government and the Tasmanian Aboriginal Land and Sea Council is ongoing.

Advice was provided on the appropriate management and promotion of a number of heritage places on State forest that have attracted the interest of community groups.

New historic sites have been updated onto the Conserve data base. Work is progressing on the entering of site data – over 200 new sites forwarded to the Aboriginal Heritage Office since 2007 have now been processed.

#### **4.6 Research and monitoring**

The Manager, Heritage and Landscape Program attended the Mining History Conference at Queenstown.

#### **4.7 Publications**

**Gaughwin, D** 2009, 'Trade, capital and the development of the extractive industries of northeast Tasmania', *Papers and Proceedings of the Launceston Historical Society*, Launceston, Tasmania.

## 5 Heritage and Landscape Program: Visual Landscape Section

### 5.1 Personnel

Table 1 Personnel

Name	Position
Bruce Chetwynd,	Senior Landscape Planner

### 5.2 Notifications, advice and site visits

Table 2 Visual Landscape Section notifications from State and private forest, 2008–09

	State forest	Private forest	Total
Advice and prescriptions provided	13	39	52
Field assessment or advice provided through computer aided analysis	12	28	40
Endorsed FPOs analysis and/or prescription	20	49	69
<b>Total notifications</b>	<b>45</b>	<b>116</b>	<b>161</b>

The Senior Landscape Planner reviewed 161 notifications for operations classified as visually significant, compared to 209 notifications in 2007–08. Fourteen additional notifications of less importance remain to be reviewed.

The review process ranged from straightforward endorsement of analysis and prescriptions provided by FPOs (43 per cent of notifications) through to comprehensive field and office assessment by the Senior Landscape Planner (25 per cent of notifications).

### 5.3 Training and education

Further input was provided on the visual landscape component for the national accreditation of the FPO training course, including restructuring and upgrading the existing visual landscape examination.

## 5.4 Planning tools and guideline development

Digital coverages of Scenic Quality for State forest and Public Sensitivity Levels for the whole state have been prepared.

A new chapter on Plantation Visual Objectives (i.e. Landscape Management Objectives for plantations) and plantation practice guidelines has been prepared to supplement the Landscape Manual.

## 5.5 Policy, reviews and management issues

The Cultural Heritage and Visual Management programs have been merged to form the Heritage and Landscape program.

Management issues arising from FPP notifications received throughout the year include:

- Plantation establishment, on both small- and large-scaled rural landscapes, continue to pose the greatest challenge for effective management of scenery values and the public viewing concerns.
- A number of private property operations for native forest conversion to plantation in prominent positions have been proposed with minimal reference or understanding of regional character and local concerns for scenic values. These need significantly more investigation and documentation of both the social and landscape context and viewing aspects.
- The shift in operations away from native forest conversion towards rural land conversion to plantation has reduced the level of visual landscape conflict. In addition, the year has seen greater acceptance by FPOs of the need for retention of existing native forest clumps within new plantation areas with the associated benefit for integrating new plantations within the rural landscape character.
- Ongoing FPA input on the management of visual landscape values of forest operations has been identified as important to municipal councils in their consideration of approval of DAs.
- A few residential subdivisions located in areas of native vegetation required landscape analysis. One developer was willing to integrate visual parameters which improved the visual landscape outcomes for the community and the presentation of the subdivision. This utilised the principles of retaining the majority of the forest on steeper and prominent slopes and targeting for development the areas less prone to viewing from outside locations.

## 5.6 Research and monitoring

Plantation expansion in the rural landscape continues to be a key concern of some rural residents. The Senior Landscape Planner is liaising with local government planners in rural areas to gain feedback on forest practices. This research aims to efficiently gauge the level of concerns and expectations of local viewers for the scenery in different regions of the state. Coupes from recent years identified through this process will be incorporated into the visual review of operations, which will include field assessments, commencing in Spring 2009.

Involvement has continued with the ARC research project 'Social acceptability of forest management options: Landscape level visualization and evaluation' with the University of Melbourne and with the Project Steering Committees for two CRC for Forestry research projects on social and economic aspects of plantations in the landscape.

As part of the ARC research project study, a 'visual landscape priority' management scenario was provided by the Senior Landscape Planner. Documentation of the method and underlying principles guiding this scenario has been commenced for presentation in the FPA landscape and ecology seminar planned for early 2010.

The Senior Landscape Planner visited the plantation regions of Western Australia's south-western region, including a field tour to discuss visual management aspects of plantations in the landscape with industry, council and state government staff. In addition, published documents were reviewed for information on the visual landscape management of forest plantations, including municipal planning policies and schemes, regional landscape policy and various forestry guidelines. A paper on this research has been prepared as a draft, with two sections still requiring review by colleagues in WA.

## Document Control Log Table

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