



Forest Practices news

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Forest Practices on King Island

Fred Duncan, Senior Botanist, Forest Practices Board

King Island is a beautiful place. Its coastal environment and rich pastures being grazed by contented cattle are a major source of its economic wellbeing, and are increasingly a focus for tourists.

The native vegetation is also important to the wellbeing of the island – protecting the coast, pastures and stock from the elements, and contributing to the clean, green image that the island community is keen to promote. And, on an island with very little topographic relief, native vegetation is also a valuable part of the scenery.

This article discusses values, conservation and management of King Island's flora and fauna, including the role and requirements of the forest practices system.

About 470 native plant species have been recorded from King Island – this is about 25% of the

number of native plant species in Tasmania. They include three Australian mainland species that do not extend to Tasmania, and 13 Tasmanian species that do not extend to the Australian mainland. Only three species of eucalypts occur naturally on King Island – blue gum (*Eucalyptus globulus*), white gum (*E. viminalis*) and Brooker's gum (*E. brookeriana*). One hundred and sixty-one native vertebrate species have been recorded from King Island: 17 mammals, 122 birds, 9 reptiles, 6 frogs and 7 fish.

King Island's native vegetation has been extensively cleared – about 30% remains, mostly in the northeast part of the island.

Elsewhere, a fair proportion of the vegetation comprises remnants in poor condition. Many species have been lost from the island, including celery top pine and the King Island race of emu. The green and gold frog has not been recorded in recent years. There are several threatened plant and animal species on King Island, including the austral mulberry (a plant used by mainland Aborigines to make fire), the green and gold frog, the hairy red snail and three subspecies of birds (scrubtit, green rosella and brown thornbill) that only occur on the island.

Most of the native vegetation comprises heath, scrub and coastal

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Overboard

Fred Duncan & Mark Wapstra, editors, FPNews

This issue of *FPNews* was assembled before the recent focus on forest practices in Tasmania. There is no doubt that our forest practices system is under more scrutiny than ever before. This places a huge amount of pressure and responsibility on FPB staff, Forest Practices Officers and others involved in forest management. This can be a good thing if it helps achieve our common objectives of sustainable forest management and continued improvement of standards and practices. Of course the cause of good forest management is not aided by distorted allegations in the media.

Many issues of *FPNews* have reported different (and often innovative) aspects of wood production, conservation and excellent practices in Tasmanian forests. We hope that such articles from field workers and specialists continue to find their way to our editorial suites.

A farewell to *FPNews* founding editor, Kevin Kiernan, who in August 1998 launched Vol 1 No 1 - see back page for more.

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Noticeboard

Forward Training Program – Forest Practices Board

Course (Contact)	Timing	Duration	Location	Course Content
Forest Botany Manuals (Fred Duncan/ Mark Wapstra)	To be confirmed	1 day	Various locations	Train FPOs in use of the new Botany Manuals
Landscape Planning Officer ¹ (Bruce Chetwynd)	6 March, 6-8 May 27 March + to be advised	4 days each	Hobart Northern Tas.	Intensive training of Landscape Planning Officers. Format will be workshop and field sessions with small groups
Forest Practices Manager training (Chris Mitchell)	April 2003	1 day	Hobart and Launceston	Update forest managers on requirements of the forest practices system
Forest practices training for supervisors (Chris Mitchell ²)	5-8 May 2003	4 day	Eastcoaster Resort, Orford	General training in forest practices for FT and other supervisors
Road drainage structures (Allan Lee ³ /Ron Neve)	mid June 2003	1 day	Huon	Training for roading FPOs in the selection and sizing of the most appropriate hydraulic structure for stream crossings
Forest Practices Officer course (Chris Mitchell)	Winter/ Spring 2003	11 days total	Various locations	Pre-requisite course for appointment as FPO
Cultural heritage (Denise Goughwin)	October or November 2003	4 days	To be confirmed	Identification and management of Aboriginal and historic cultural heritage sites

1. Course will be repeated at a later date in each region of the State, dependent on demand
2. Course run jointly by Forestry Tasmania and Forest Practices Board
3. Course run jointly by Forestry Tasmania and Forest Practices Board (Allan Lee, Forestry Tasmania, ph. 62338128)

Native Forest Silviculture Technical Bulletins

John Hickey, Principal Research Officer, Native Forests, Forestry Tasmania

Native Forest Silviculture Technical Bulletins are prepared by Forestry Tasmania to guide silvicultural operations in native State forest. They are also relevant for native private forests and are used as resource materials for Forest Practices Officers. The series commenced in 1990 and the bulletins are revised as required to take account of new information and practices (Table 1).

Copies of the Technical Bulletins are available from the Division of Forest Research and Development, Forestry Tasmania, 79 Melville Street, Hobart, Phone (03) 6233 8219, email: silviculture@forestrytas.com.au. The price for each bulletin for external sales is \$30, or \$300 for the series of 13 bulletins.

Table 1. Tasmanian Native Forest Silviculture Technical Bulletin Series

No	Title	Release Date	Revised
1	Eucalypt Seed and Sowing	1991	
2	<i>Eucalyptus delegatensis</i> Forests	1990	2001
3	Lowland Dry Eucalypt Forests	1991	2002
4	High Altitude <i>E. dalrympleana</i> and <i>E. pauciflora</i> Forests	1990	
5	Silvicultural Systems	1994	
6	Regeneration Surveys and Stocking Standards	1996	
7	Remedial Treatments	1992	
8	Lowland Wet Eucalypt Forests	1998	
9	Rainforest Silviculture	1998	
10	Blackwood	1991	
11	Silvicultural Use and Effects of Fire	1993	
12	Monitoring and Protecting Eucalypt Regeneration	1999	
13	Thinning Regrowth Eucalypts	1998	2001

Landscape

What you see is what you get: the importance of visual clues in forest management

Graham Wilkinson, Chief Forest Practices Officer, Forest Practice Board

The objective of Tasmania's forest practices system is to achieve sustainable forest management. We justifiably take great pride in the sound scientific basis of our forest management systems. We understand that ecological processes involve disturbance and change. We point out that natural processes such as wildfire, disease, flood and wind throw are not orderly or pretty.

We use this analogy to defend the inherent untidiness of forest harvesting. We are therefore frustrated when critics ignore the science and condemn our practices as unsustainable. We do more research, try to explain the complexity of sustainable forest management and point out the importance of jobs and economic development. Despite this, we continue to be dismayed when people use the simple eyeball test to condemn our practices.

Why? Partly, in my view, because foresters for too long have responded to *social* concerns with *scientific* and *economic* justifications. The science and economics are important, but over 80% of public perception is based on visual clues. If a clearfell and burn operation is not visually acceptable to the public, then it is not socially sustainable. Foresters are patient souls who understand the long term nature of forestry. The public is not so patient or well informed. Increasingly, we are dealing with the 'now generation' who want things now, not tomorrow, or next year, let alone the 200-400 years that it might take to replace an old growth forest. The 'now generation' knows from watching 'Backyard Blitz' that mature gardens are created over a weekend, not over the years that a more patient generation accepted. The 'now generation' buys instant advanced trees and potted bloomers, not the seeds or seedlings of their parents' generation. Likewise, they do not see a clearfelled coupe as a forest – to them the forest is destroyed, gone forever.



Well designed coupe with scalloped edges and patches of retained forest. This coupe retains the natural skyline and blends into the existing mosaic within the landscape better than a large clearfell with straight edges.

So what does visual perception mean for forest management in the 21st century? Clearly we can neither freeze our forests in time nor ignore the compelling scientific, economic and social evidence for sustainable forest management. However, I believe that there are four main issues that need to be addressed.

1. Dramatic change is not appropriate in some places. We need to recognise that we are no longer a pioneering society where people accept, without question, the need for changes to their landscape. In many developed countries large tracts of forest are managed primarily to preserve or enhance their amenity value rather than their wood production value. In Virginia, foresters within the increasing urban-forest interface talk about forest management as 'tending the garden'. Within Tasmania, most people accept that there will be some places where dramatic changes to the landscape are not

in the public interest. These areas need to be better identified strategically and we need to reach agreement on their future management.

2. Ugly operations are not socially sustainable. Maintenance of landscape amenity does not necessarily mean that logging cannot occur. It does mean that the logging has to be properly designed to deliver acceptable outcomes. This requires careful attention to the shape, size and timing of coupes. We also need to accept that untidy forest operations look bad! Rutted roads and snig tracks, ragged coupe edges, waste wood on landings and burnt-out reserves are seen as evidence of unsustainable and wasteful practices. No amount of expert environmental or economic argument will change this perception. Harvesting native forests will never be an entirely

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King Island

from front cover

communities, mainly growing on fairly infertile soils or exposed environments. Taller eucalypt and paperbark forests are associated with better soils and have been extensively converted to agriculture. The Tasmanian Regional Forest Agreement recognises these forests as



Remaining eucalypt forest on King Island

endangered communities. Continued conversion is the greatest threat to the remaining native vegetation, and therefore to King Island's biodiversity. Other threats include frequent fires, stock damage and the root rot fungus, *Phytophthora cinnamomi*. This fungus can kill many of the characteristic heath species (e.g. *Banksia*) that provide food and shelter for much of the fauna.

Over the last few years, there has been a lot of focus on management and conservation of King Island's remaining native vegetation. This has come about for several reasons. They include:

- Surveys of King Island's natural values, and publication of a report on the vegetation of the island (through Bushcare);
- Land degradation issues (e.g. salinity) being identified;
- Requirements of King Island's planning scheme becoming more widely known to landowners wanting to clear bushland;
- Natural resource management activities, such as fencing assistance and weed control programs being undertaken by

landowners with support from NHT funding;

- Actions of the Private Forest Reserves Program, which has given a high priority to liaising with landowners to protect forest and scrub on King Island;
- Changes to the *Forest Practices Act*, which mean that a Forest Practices Plan is now needed for proposals to clear areas (of over 1 ha) that currently support woody vegetation capable of reaching 5 m in height.

Many landowners are interested in retaining natural vegetation on King Island, for a variety of reasons. They include its aesthetic value, its role in retaining local plants and wildlife, its value as shelter for stock, protection of water quality, and control of erosion and salinity. There is also a realisation that once clearing and disturbance of native bushland reaches a certain level, the bushland (and its cargo of native plants and animals) is at much greater risk of further degradation and loss – through edge effects, wildfire, droughts or other reasons. Based on research in other areas of Australia, and some observations on King Island, I believe that

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neat, orderly and visually pleasing practice. However, there is much that can be done to project an image of good planning and professional pride in well-conducted operations. I have seen many examples of good operations – things like: set-backs from important roads; the use of matting to avoid rutting; small, well-located landings; small coupes with neat edges; and well-protected streams and reserves. These examples are a reflection of the forest practices officers and loggers who take great pride in achieving good outcomes.

3. *Inform the viewer.* Recent examples of public outrage following the

clearfelling of plantations highlight the need to provide signage, local publicity and interpretation in some situations. The message should be positive and informative, not defensive or aggressively asserting proprietary rights. Poorly designed signage can be inappropriate and in itself visually polluting. However, well-planned signage and interpretation facilities can inform and promote the interesting and beneficial aspects of our work.

4. *Engage the community.* People respond more negatively to change when it comes as a surprise or as a *fait accompli*. People are more likely to accept

change when they feel that they have participated in the process. Minimum standards for communication with neighbours are laid down in the *Forest Practices Code* and the *Good Neighbour Charter*. The industry needs to continue to go beyond these minimum requirements.

The management of change in the visual landscape is more about managing social attitudes and culture than it is about managing trees and land.

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King Island

vegetation clearance on much of the island has reached a critical level. Further decline in quality of remnant vegetation and abundance of native species is certain to result from continued clearing.

Forest Practices Board staff (Fred Duncan and Raymond Brereton) and Forest Practices Officer Brett Miller visited King Island in September 2002. They assessed several areas proposed for clearing on different properties and provided advice on the forest practices system and the Private Forest Reserves Program. We covered a lot of territory, despite wet ground conditions, and enjoyed meeting landowners and seeing their properties. We also liaised with Council staff and people involved with Natural Resource Management programs, with the aim of developing an integrated system for dealing with clearing applications.

Several Forest Practices Plans were prepared, mainly involving clearance of scrub (including some areas of regrowth from past clearing). Most landowners appreciated the value of maintaining areas of native vegetation, though it is fair to say that not all agreed with some of the constraints required by the Forest Practices Code, RFA or other policies. It was very gratifying to see that some important areas of forest, scrub and heath are being protected by many landowners.

Areas of some vegetation types such as eucalypt forests, tall paperbark forests and wetlands are protected from clearing through the RFA and the forest practices system. Many landowners were keen to protect these environments – some taking advantage of fencing assistance to exclude stock. The forests are particularly important vegetation types for conservation because they provide habitats (e.g. tree hollows and deep litter in the older forests) that are used by many of the



Brett Miller, Raymond Brereton (centre) and landowners Donald and Neil Graham (left and right) sample some over-mature King Island beef while surveying a property near Narracoopa. The Graham family have developed conservation agreements for important areas of scrub and forest, through the Private Forest Reserves Program.

threatened animal species on King Island. Many of King Island's threatened plant species also occur in forest environments. The eucalypt forests are also interesting because the provenances (gene pools) of the three eucalypt species are distinct from those on the Tasmanian and Australian mainlands. In the case of *E. globulus*, the King Island provenance contains valuable commercial characteristics and forms the basis

of varieties of *E. globulus* grown in plantations in many countries. As with all species that provide economic benefits, it is important to maintain such useful gene pools. Island provenances are particularly vulnerable to loss.

Further clearing is proposed for some areas of native vegetation on King Island. Much of this clearing will require Forest Practices Plans

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that are prepared by Forest Practices Officers and paid for by landowners. Clearing of forest and scrub without an authorised FPP could result in prosecution under the *Forest Practices Act*.

Some owners with large areas of bushland on their properties are developing 'whole of property' plans. This means that conservation values (and the range of other benefits provided by native vegetation) can be better considered when they are

working out their management plans. This information will also be useful if FPPs are subsequently required.

Compared to most other areas of Tasmania, there are particular problems with maintaining native vegetation (and biodiversity) on King Island. These problems include the island's isolation (which makes recolonisation difficult if a species declines dramatically), the severe degradation that can result from stock damage, and the climate. In

addition, much of the vegetation occurs as remnants. Restoration of diverse native vegetation (as opposed to simplified tea-tree or paperbark scrub) can be difficult once an area is cleared. The role of native vegetation in providing other economic and environmental benefits should also be considered when landowners and government bodies are making decisions about land use on King Island.

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A letter from King Island

Following a casual enquiry regarding forestry operations on King Island, Sarah Munks received the following letter from Nigel Burgess - the FT representative (part-time) on the island. Nigel agreed to sharing the letter with FP News readers. It gives an interesting background to commercial forestry activities on King Island. The editors have made a couple of minor changes to the text...

Dear Sarah,

You asked about Forestry on King Island. Extensive clearing of the island for the post WWII land settlement scheme resulted in the loss of much of the island's forests. The old land clearing practice of unrestricted burning, preferably in January/February with a good hot north wind, destroyed all but a few remnant patches of the original bush, including temperate rainforest in about a third of the southeast side of the island. After the last big fires in 1939, the landscape was covered by thousands of tall black poles some 100 ft tall. Isolated stands of blue gum, white gum and Brookers gum survived along with various ti-tree, Banksia, Acacia mucronata, blackwood and a host of lesser scrubby bushes. In some of the deeper creeks, excellent stands of paperbark and blackwood can be found. The Pegasus State Forest is near the middle of the Island and about 5 km inland from Naracoopa on the east coast. It covers an area of 1250ha. It is bound by the Pegasus road to the south and private property on the other boundaries. An extensive bush block adjoins the east side and some old mine workings can be found in the northeast. The Fraser River to the north and Yates Creek to the west are general lines of separation.

The land covered by the Pegasus Forest Reserve is of many and various soil types, readily delineated by the changes in vegetation. There are two reasonable remnants of local bush: on the north side a fine stand of KI blue gum, based on Rafferty's Creek and to the northwest a good stand of white gum in the Yates Creek area.

As a request from the King Island Council in 1939, the Forestry Commission started planting hardwood (stringybark and black peppermint) and *Pinus radiata* at Pegasus. *Pinus radiata* were planted extensively in the area until 1971 with lesser patch planting till about 1990. No local eucalypts were planted in the area, until 1988 when a small area was planted with KI blue gum as a local seed source. Unfortunately, the gums grow best on better soil types but the majority of such land on the island had been previously cleared for agricultural purposes. Hardwoods have not been planted in the area for many, possibly 30, years.

Some of the planted stringybark compartments have been cut for firewood as there were not many well developed trees, most grew into a very bushy form. The better areas of stringybark are still inland, though these are occasionally "pinched" for fire wood. There was a very basic mill set up in 1970s, it was recently demolished. It was established to mill radiata logs for the local building trade, but was not cost effective. A pressure treatment plant was also established to treat radiata pine posts at about the same time but costs and lack of labour terminated this project as well. More recently contractors were employed to harvest and ship out some of the older compartments of radiata pine. The logs were shipped to Korea but the market

collapsed and the contractors immediately ceased operations and moved out. A mess remains where they were cutting and no clean up operation has been undertaken, just the local wood collectors carting out from the easier heaps of logs.

So, what is left of the planted forest at Pegasus just grows. A lot of radiata pine and stringybark seedlings are sprouting in the harvested areas, though the radiatas are getting a hard time from the Xmas tree collectors!

There are two other Forest Reserves in the Mt Stanley area - both of about 50 ha. One is of Brookers gum and in good shape and the other nearer the Kentford Road has been seriously cut for posts, chopping blocks and fuel wood. It still has good stands of blue gum mixed with Brookers gum and local shrubs.

The Pegasus Forest Reserve does not appear to be of great economic value. There would be little economic purpose in planting the areas that have been logged - maybe it is best to just let Nature naturally seed it. There is little local market for milled timber - a local farmer has a spot mill and cuts a few logs into scantling to order. Shipping costs are also an inhibiting factor if the logs were to be shipped from King Island to mainland ports. However, Pegasus has value for fauna diversity with the highest concentration of forest bird life of anywhere on the island. The forest provides established nest sites for yellow-tailed black cockatoos and green rosellas, despite the impact of wood cutters and competition by the brush tailed possums and of course the ubiquitous starling.

Regards

Nigel Burgess

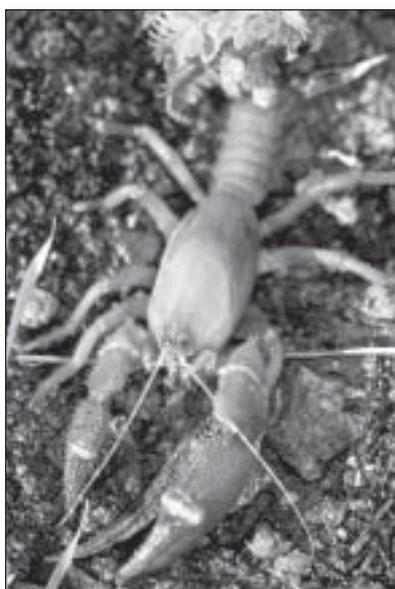
Managing special values in private forests

Bronwen Hayes, Communications Consultant, Private Forest Reserves Program

As a forestry consultant, Scott Livingston provides advice to others about the best ways to manage their forests. On his own property at Underwood in the north of the State, he is making use of the Private Forest Reserves Program to manage a 10 hectare area of forest.

The patch may be small, but it is home to several threatened species. Scott has placed a conservation covenant on this section of his property to give long-term protection to the forest.

The Private Forest Reserves Program is a voluntary scheme to conserve significant native forest



The Mount Arthur burrowing crayfish. (photo by Dr Niall Doran)

on private land. It targets forest communities that are not well-protected in existing reserves, such as national parks. Another important focus is saving the habitat of threatened plants and animals. The Program offers a range of incentives including an up-front payment to covenanting landowners.

Scott Livingston's covenant is protecting an area of wet white gum (*Eucalyptus viminalis*) forest and a smaller section of tea-tree and paperbarks. "I have had the property for 18 years and before that my parents owned it for 11 years," said Scott. "I grew up here. I knew it had special values but I assumed it would not rate highly with the Program because of its

small size," he said. However, the Private Forest Reserves Program was excited by the opportunity to secure forest types that are poorly reserved statewide. The property also contains important habitat for the giant freshwater crayfish and the Mt Arthur burrowing crayfish. Both vulnerable species are found in the creek that runs through the forest. In addition a rare plant, the drooping sedge (*Carex longibrachiata*) has been found in the area. "Recently, there's been another interesting species found here," said Scott. "A new species of freshwater snail has been identified and is known to be living here in the creek. They are tiny – their shell is less than 2 millimetres wide," he said. Another 3 hectares of Scott's property has been fenced and is being managed under a 10 year management agreement with the Tamar Natural Resource Management Strategy.

Part of Scott's work with his consultancy, Tas Land and Forest, requires him to assess the special

values of forested areas. He said that he had recommended the Private Forest Reserves Program as a useful alternative for some landowners, particularly in situations where important values could be compromised by logging. "The availability of a financial incentive is good," said Scott. "For most people I deal with, their properties represent their livelihoods. If the community wants places reserved, the community needs to help foot the bill," he said. As for his own covenant, Scott said that he was very happy to participate in the Program. "I do believe that conservation is important and that when there's special values present they are worth protecting," he said.

To find out more about the Private Forest Reserves Program call 1300 660 062 or visit the web-site at www.pfrp.tas.gov.au

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Part of the wet white gum forest now protected.

Forest Practices System

Mark Wapstra, Scientific Officer, Forest Practices Board

In the next few issues of *FPNews* we will be featuring a profile of the forest practices system, its philosophy, its structure and in particular, the people behind the names on the Board itself, the Forest Practices Advisory Council and the Research and Advisory Programs. We begin with an overview of the forest practices system, and profile the five members of the Board.

Tasmania's forest practices system forms a key part of the State's sustainable forest management framework. The statutory objective of the system is to achieve sustainable management of Crown and private forests (*Forest Practices Act 1985*).

About the Forest Practices Board

The Forest Practices Board is an independent statutory body that fosters a cooperative approach towards policy development and management of the forest practices system.

What does the Board do? The Board oversees the administration of the forest practices system. It meets once a month to consider matters of policy and high level decisions. The day to day management of the system is the responsibility of the Chief Forest Practices Officer, the Board's staff and Forest Practices Officers.

The diagram over leaf shows the structure of the forest practices system in Tasmania.



Members of the Forest Practices Board

The Board has five members who are appointed in accordance with the *Forest Practices Act*.

- Secretary of the Department responsible for the *Environmental Management and Pollution Control*

Act 1994 - Kim Evans (Chair of the Forest Practices Board).

After completing a BSc (Hons) majoring in Marine Science at the University of Tasmania in 1982, Kim began his career as a Marine Biologist with the Tasmanian Fisheries Development Authority. He moved into a resource management role in 1985 when appointed as the Assistant Director (Fisheries) with the Department of Sea Fisheries. After spending three years as the Director of Fisheries, Kim was appointed as the Secretary of the Department of Primary Industry and Fisheries in 1996 before taking over in his current role as Secretary of the Department of Primary Industries, Water and Environment in 1999. In his role as Secretary he has held a number of positions including Chairmanship of the Rivers and Water Supply Commission, the Hobart Regional Water Board and the North West Regional Water Authority. He is currently Chairman of the Tasmanian Institute of

Agricultural Research, the Tasmanian Aquaculture and Fisheries Institute, the Environment Management and Pollution Control Authority and the Tasmanian Natural Resource Management Council. Kim represents the State Government on a number of national standing committees and other Boards. He has extensive experience in natural resource management, particularly relating to water, primary industry and the marine resources.

- Director of Private Forests Tasmania appointed under s.8(1)(c) of the *Private Forests Act 1994* (being a person with expertise in forest or related sciences) - **Dr Peter Volker**.

Dr Peter Volker became a member of the Board in 1998. Peter has a BSc (Forestry) and GradDipSc (Forestry) from ANU and PhD from University of Tasmania. His research speciality is tree breeding and genetics of eucalypts. He has also implemented and supervised projects in plantation and native forest silviculture and ecology. He has 20 years post graduate experience in forest research and operations having worked at Forestry Commission Tasmania, CSIRO Forestry, ANM Forest Management, Serve-Ag and more recently in his own business, Total Sylvan Enterprises. Peter has played an integral part in the formation and management of research programs in three Co-operative Research Centres as well as participating in a number of research bodies at local and national levels. He has travelled to plantation operations and inspected research programs in Africa, South America and Asia. Peter's expertise brought a practical knowledge of research and extension into field operations to the Board. [Peter resigned as a member of the Board in December 2002 to take up a research position with Forestry Tasmania. A new director has not yet been appointed].

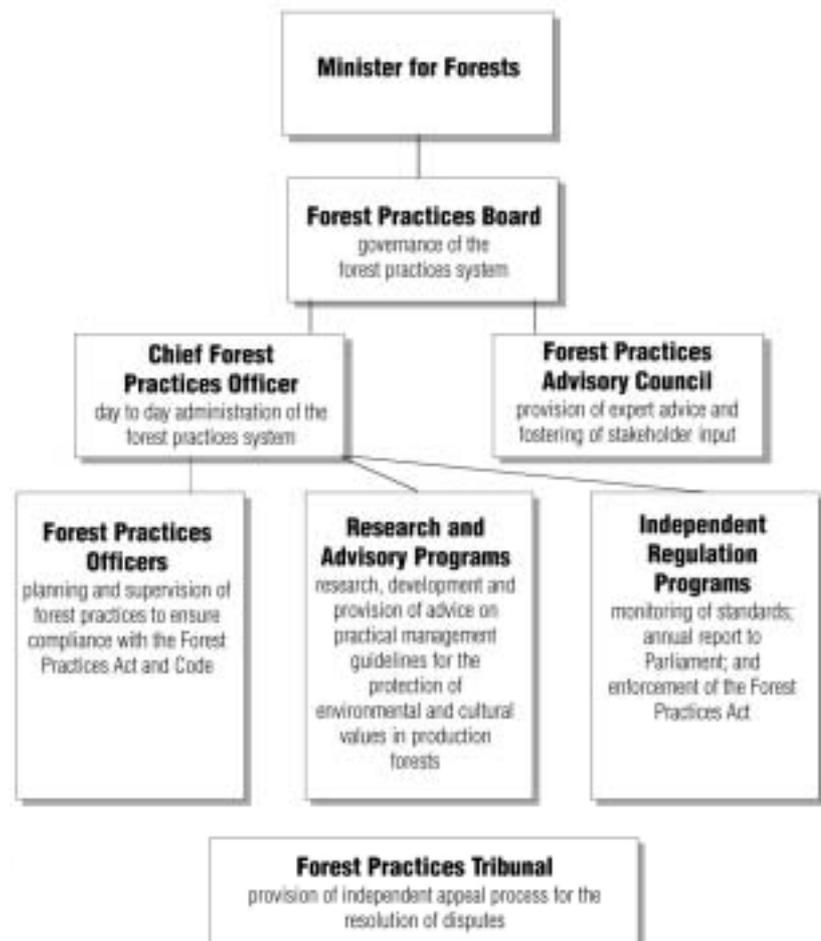
- Director of Forestry Tasmania appointed under s.12E(1)(b) of the *Forestry Act 1920* (being a person with expertise in forest or related sciences and knowledge of and experience in forestry) - **Dr Humphrey Elliott**.

Forest Practices System

With a PhD from the University of Sydney, a BSc in Forestry from ANU and a Diploma of Agricultural Entomology from the University of Sydney, Humphrey's research career into forestry-related subjects spans three decades. He has held numerous professional positions on many forest research organisations such as the Tasmanian Forest Research Council, Forest Research Working Groups, and Co-operative Research Centre for Sustainable Production Forestry, and is an Honorary Research Associate with the Departments of Plant Science and Agricultural Science at the University of Tasmania. Humphrey is an internationally recognised research scientist and spent 14 years as Chief of the Division of Forest Research and Development, Forestry Tasmania. He has published papers, books and reports, and coordinated research on a diverse range of topics including silviculture and protection of forests.

- A person having expertise and knowledge of local government, who is a representative of a municipal area in which forestry is a major land use - **Roger Chalk A.M.**

A life-long resident of the North West Coast, Roger Chalk has an extensive background in local government affairs, business and agriculture. Roger was selected to represent local government on the Forest Practices Board in July 1999. First elected as Mayor of the Waratah-Wynyard Council in November 2000, and again in November 2002, Roger's local government career began when elected to the Wynyard Council in 1976. He was subsequently elected to the Waratah-Wynyard Council in its formation in 1993, serving in various positions including Treasurer and Warden. The Waratah-Wynyard Council area has extensive forestry activities in



native forests and plantations on both private property and State forest.

- A person having expertise in the harvesting and processing of timber - **Ross Waining**.

Ross Waining was appointed to the Forest Practices Board in 1999. Graduating from Sydney University with a BSc (Forestry) in 1962, and also holding a Diploma of Forestry from the Australian Forestry School (Canberra), Ross has extensive experience with the harvesting and processing of timber. Ross has harvesting experience in sawmilling (Harvesting Superintendent, Herons Creek Timber Mills, NSW), reconstituted panel production (Chief Forester and Mill Superintendent, Masonite Mill, Raymond Terrace, NSW) and woodchip production (Manager, Forest Resources, Tasmania);

processing experience in reconstituted panel production, Manager, Burnie Board Mill, Burnie, Tasmania), sawmilling (Special Projects, Tasmanian Board Mills) and woodchip production (Manager, Forest Resources, Burnie). Ross' forestry experience extends into forest management and plantation development in NSW (Herons Creek Timber Mills and Masonite Mill, Raymond Terrace) and Tasmania (Private Forestry Division of the Forestry Commission and Forest Resources). More recently he was appointed by Department of Primary Industries, Water and Environment as one of the negotiators to have landowners commit their forest land to the RFA Private Forest Reserves system.

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Forest Practices System

Investigation of complaints

Chris Mitchell, Forest Practices Adviser, Forest Practices Board

Readers of the Forest Practices Board Annual Report will have noticed it has a section entitled “Investigation of Complaints”. This section summarises the results of investigations undertaken by the Board into alleged breaches of the *Forest Practices Act*.

Investigations are triggered by:

- Reports received from Forest Practices Officers indicating that a breach has occurred;
- Board audits or Certificates of Compliance detecting significant breaches;
- Complaints from the public alleging breaches.

When investigated, the majority of the former two categories are not surprisingly found to involve actual breaches of the *Forest Practices Act*. However, many complaints received from the public are found to not involve any breach. This is understandable as the public is less familiar with forestry and the forest practices system. Nevertheless, it is important that the forest practices system is transparent and publicly accountable and all complaints from the public are treated seriously.

The Board creates an investigation file for each complaint received. At the completion of each investigation the Chief Forest Practices Officer signs off the file with regards to the action taken, and the complainant is advised of the outcome. The Board also has an audit committee that samples case files to ensure that the approach taken by the investigation officers is equitable and consistent.

In most cases the Forest Practices Board will seek preliminary

information from the Forest Practices Officer (FPO) responsible for the operation. The Board will then conduct an independent investigation of the matter. The board engages independent legal investigators where necessary to collect evidence and statements.

In most instances the Forest Practices Board officer responsible for the investigation will arrange for a site inspection with the FPO. The Board officer will subsequently prepare a report for the Board. The Board will then determine what action to take. The options are a fine or prosecution for more serious or repeated offences, some other form of penalty such as a compensation agreement, or a warning letter. In making a judgement the Board also takes into account factors such as the amount of environmental damage, the intent, the degree of negligence, and the previous record of the person or organisation responsible for the breach. Serious matters are referred to the Director for Public Prosecutions.

Two examples are provided below illustrating how the Board may proceed after becoming aware of a breach of the *Forest Practices Act*.

Example 1: An organisation detects a breach during an audit of its own operations. It has an environmental management system, and under that system it reviews its procedures

and finds that a change to procedures is warranted. It changes the procedure and reports the matter to the Forest Practices Board. The Board endorses the approach made by the organisation in changing its procedures. Assuming the breach is not serious and environmental damage is insignificant, the Board would in this circumstance usually determine that appropriate corrective action has been taken by the organization.

Example 2: A breach is detected by the Board, through an audit or public complaint. The Forest Practices Board investigates the breach and finds that the organisation responsible had no employee training in place, and had not made its employees aware of the requirements in the Forest Practices Plan. In this instance the Board may impose a fine on the organisation responsible.

The Forest Practices Board encourages a responsible approach to forest practices with emphasis on minimising and avoiding future breaches. Organisations must have a commitment to not only comply with the *Forest Practices Act* but to continuous improvement. A systematic approach is needed to achieve this goal.

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Guidelines for contributors

Forest Practices News is published quarterly by the Forest Practices Board, Tasmania. *FPNews* provides a means for communicating new ideas and developments among those interested in the sustainable management of Tasmania's forests. We particularly welcome contributions from practising Forest Practices Officers. We welcome both feature articles and shorter contributions of even just a paragraph or two. Please include illustrations with your contributions if at all possible. Contributions can be supplied either as hard copy or electronically. If forwarding material electronically, the address is info@fpb.tas.gov.au. Please ensure that figures/pictures are sent as separate files and not embedded in Word documents. We look forward to seeing you in print in *FPNews*!

Flora

Case study: strategic planning for *Tetratheca gunnii* on State forest

Allison Woolley, Conservation Planner, Forestry Tasmania

Strategic planning for threatened plant species on State forest was outlined in the second last issue of *FPNews* (June 2002, vol 4 no 4). This article discusses management of *Tetratheca gunnii*, a threatened species that occurs on State forest in the Beaconsfield area.

Tetratheca gunnii (shy Susan) is one of Tasmania's rarest plants. It is listed as an endangered species on the Tasmanian *Threatened Species Protection Act* and as critically endangered on the Commonwealth *Environment Protection and Biodiversity Act*. The species faces a high risk of extinction in the wild. It has an extremely restricted habitat and is sparse within that habitat (i.e. it is rare within a rare habitat), and is susceptible to serious threats within its range.

Tetratheca gunnii is a short-lived, semi-prostrate undershrub with lilac flowers that have a distinctive black centre. It is only found in the Dans Hill – Mt Vulcan area in the foothills of the Dazzler Range near Beaconsfield in northern Tasmania. Until recently, the species was only known from specimens collected (from one site) by Ronald Campbell Gunn in 1843. (Gunn was one of Tasmania's foremost botanical collectors, and his name is recalled in many species, including *Eucalyptus gunnii* and *Nothofagus gunnii*). *Tetratheca gunnii* was presumed to be as extinct as its discoverer. However, it was relocated in 1985 by some familiar names in forestry and conservation biology circles – Fred Duncan, Mick Brown, Jamie Bayly-Stark and Neil Gibson (Brown *et al.*, 1986).

Subsequent surveys and research (e.g. Barker, 1996) have provided useful information on the distribution and ecology of *Tetratheca gunnii*. Some 340 individual plants have been recorded from about eight populations in the wild. Population size is difficult to assess accurately, as numbers can

fluctuate substantially within and between populations. However, surveys have demonstrated that *Tetratheca gunnii* is restricted to an area of less than 25 km² and only grows on soils derived from serpentinite, an ultramafic rock that is also of interest to mineral prospectors. Much of the habitat of *Tetratheca gunnii* has been mined for asbestos and other minerals, and some populations occur on open sites resulting from mining disturbance. *Tetratheca gunnii* is typically found in heathy *Eucalyptus amygdalina* - *E. ovata* forest.

Two other threatened species occur on serpentinite in the Beaconsfield area. They are *Spyridium obcordatum* (northern dusty-miller), listed as a vulnerable species on both the *Threatened Species Protection Act* and the *Environment Protection and Biodiversity Conservation Act* and *Epacris virgata* (pretty heath), listed as an endangered species at the national level and a vulnerable species at the state level. Serpentine soils throughout the world are known for their high levels of endemic flora – small areas of serpentinite on Tasmania's West Coast also contain threatened species that are restricted to this geology.

Why is *Tetratheca gunnii* endangered?

What are the threats to *Tetratheca gunnii*, apart from trampling by botanists and others involved in conserving the species?

Tetratheca gunnii is endangered for several reasons. Research has shown that successful seed production requires outcrossing, and its lack of fecundity (ability to reproduce) may be due to the small

and fragmented nature of its populations. The populations themselves are subject to great fluctuations in numbers under normal circumstances, and are particularly vulnerable to extinction from one-off events such as a serious wildfire.

Two of the greatest threats to the survival of *Tetratheca gunnii* are inappropriate fire regimes and the introduction of the root-rot fungus, *Phytophthora cinnamomi*.

Until very recently, much of the habitat of *Tetratheca gunnii* had not been burnt for many years. If fires are too infrequent, *Tetratheca gunnii* is disadvantaged by competition from other understorey species. On the other hand, a severe wildfire will kill plants and deplete the seed that is stored in the soil.

The introduction of *Phytophthora* can occur through the use of contaminated machinery in forestry operations, track construction, mineral exploration and firewood collection; and recreational activities such as motorbike riding, off-road vehicle use, horse riding and orienteering. *Phytophthora* can also be carried in surface water, allowing the pathogen to move into an area from a nearby contaminated site. Two populations of *Tetratheca gunnii* are infected with *Phytophthora*. Other populations are at risk because they are downslope from infected sites (including a disused quarry where *Phytophthora* was introduced during rehabilitation work).

Conservation planning for *Tetratheca gunnii*

A management plan for *Tetratheca gunnii* is being jointly developed

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by Dept of Primary Industries, Water and Environment, Forestry Tasmania and the Forest Practices Board. The plan takes account of information in the *Tetratheca gunnii* Recovery Plan, and requirements related to Critical Habitat of the species.

Recovery Plan

A Listing Statement and Recovery Plan for *Tetratheca gunnii* have been prepared by DPIWE (Potts and Barker 1999). The Recovery Plan can be accessed on the DPIWE website – follow the steps given in the *Web Sightings* article in the last issue of *FPNews*. The plan sets out actions to reduce risks to the species, and maintain and enhance current populations. The Recovery Plan calls for an adaptive management approach, to take account of new circumstances and information related to *Tetratheca gunnii*.

Critical Habitat

The *Threatened Species Protection Act* provides for identification of Critical Habitat (i.e. habitat that is vital to the survival of threatened species). Identification of Critical Habitat allows conservation planning to focus on sites with the potential to support such species.

Tetratheca gunnii is the first Tasmanian plant species to have Critical Habitat delineated. It covers about 500 ha, and corresponds to areas on serpentinite in the Beaconsfield area. The boundaries were determined from geology maps and ground-truthing.

Critical Habitat for *Tetratheca gunnii* includes areas on State forest; the proposed Dans Hill Conservation Area; three properties purchased through the Private Forest Reserves Program (which also support populations of *Spyridium obcordatum* and *Epacris virgata*); and private land (small areas). State forest forms about 25% of the Critical Habitat, and is located in



Tetratheca gunnii (photo: Paul Black)

Andersons Creek Forest Reserve (47%), informal reserves (37%) and production forest (16%) – this includes three coupes proposed for partial logging within the current 10 Year Plan period (see below).

Adaptive management on State forest

An adaptive management strategy is being used on State forest to take account of *Tetratheca gunnii* and its habitat. This strategy integrates information on:

- the distribution of the species on State forest and other tenures;
- habitat, ecology and conservation requirements of the species;
- threats to the species;
- on-site planning by Forestry Tasmania (Mersey District), including planning for logging operations, fire planning and management of roads and tracks.

The management strategy focuses on land use within the Critical Habitat area. Activities (e.g. wood production and roading) within the Andersons Creek catchment, but outside Critical Habitat, also need to be considered. This is

particularly the case where Critical Habitat is downslope of operational areas.

How will management be implemented on State forest?

The Critical Habitat boundary and most recent site information for *Tetratheca gunnii* (and the other serpentine endemics) have been captured in Forestry Tasmania's GIS system.

Use of GIS coverage of other attributes within the management area allow catchment level planning for issues that might affect *Tetratheca gunnii* or other threatened species in the area. These attributes include locations of past, current and proposed logging; locations of roads, tracks and quarries; and database records of *Phytophthora*. Maps related to fire management can also be accessed on the GIS.

Forestry activities with the potential to affect populations of *Tetratheca gunnii* (or the other threatened species) would be preceded by botanical assessments, and appropriate liaison with specialists from the Threatened Species Unit of DPIWE.

Flora

An example of management to reduce risk to *Tetratheca gunnii* is the rationalisation of roads and tracks within the Andersons Creek catchment, taking into account location of populations of *Tetratheca*, potential risks to the populations, and requirements for access for wood production, fire management or other reasons. Closure and rehabilitation of some roads is proposed. Weed control may be needed on some sites. Occurrence of *Tetratheca gunnii* and other threatened species was considered when Mersey Forest District assessed recreational use of tracks in the Dazzler Range State Forest.

Within and adjacent to the Critical Habitat, logging may need to be excluded from some areas of "production forest", and in other coupes silvicultural practices may

require modification. Specific prescriptions may be needed for machinery hygiene, location of tracks and landings and regeneration burning.

Forestry Tasmania will also be involved in strategic fire planning and management, to protect and enhance habitat for the species. A highly successful (and hot!) ecological burn was completed in April 2002 within the Dans Hill area by Forestry Tasmania in conjunction with DPIWE. Since this fire, regeneration of the species has occurred. Fencing work has been undertaken on State forest and Crown Land within the area to assist manage regenerating plants. Future zoning of areas will take into account short and long-term threats to the survival of *Tetratheca gunnii* as well as the other threatened species in the area.

Prescriptions will be delivered via existing systems at the operational level. Management prescriptions will be reviewed as new information becomes available.

References

Barker, P.C.J. (1996). *Selecting viable populations of threatened species for conservation management*. Forestry Tasmania and ANCA, Hobart.

Brown, M.J., Bayly-Stark, H.J., Duncan, F. and Gibson, N. (1986). *Tetratheca gunnii* Hook.f. on serpentine soils near Beaconsfield, Tasmania. *Papers and Proceedings of the Royal Society of Tasmania* 120: 33-38.

Potts, W.C. and Barker, P.C.J. (1999). *Tetratheca gunnii* Recovery Plan 2001-2005. DPIWE, Hobart.

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Book review

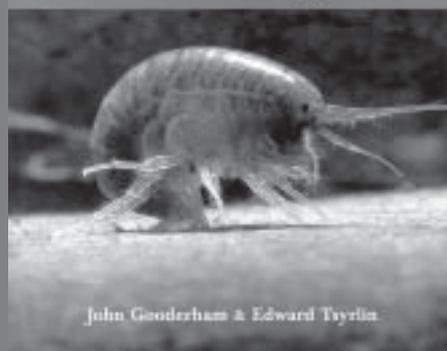
We will try to feature a book review in each issue of FPNews. We welcome reviews from our readers on books and articles on forestry-related subjects, particularly those relevant to forest practices planning.

The Waterbug Book

John Gooderham and Edward Tsyrlin



The Waterbug Book



Reviewed by Sarah Munks

Ever wanted to know if the 'looks like a spec of dirt' you have found in a Class 4 is one of those threatened hydrobiid snails or if the crayfish you have just found is likely to be one of the threatened *Engaeus* species? Or have you ever been curious about what all those other swiggly, blobby, spiny and slimy bugs are that you found whilst checking for signs of our threatened aquatic fauna during your coupe survey?

Well, there is now a book for you!

Written by stream ecologists John Gooderham and Edward Tsyrlin, *The Waterbug Book* has 232 pages of information and fantastic photographs of the freshwater macroinvertebrates that live in Tasmania's streams, rivers, lakes, farm dams and muddy puddles. The introductory chapter provides background information on the habitats occupied by the water bugs and freshwater ecology in general. A simple 'back of the envelope' method for conducting small-scale river health assessments is also provided. In the next section, a key with very nice artwork is provided to assist readers in the identification of their captured bug. The rest of the book is devoted to providing information on specific groups of bugs, illustrated with over 350 spectacular macro-photographs of live specimens.

This book is an invaluable reference for FPOs, Fauna Officers, and all those amateur naturalists and fly-fishing enthusiasts among you. Those who carry out water monitoring projects will find it especially useful.

Published by CSIRO and retailing for \$39.95, the book is available at Fullers Bookshop.

Fauna

Fauna Course 2002

Raymond Brereton, Suzette Wood and Karen Richards, Forest Practices Board

Another successful four day fauna course conducted by the Forest Practices Board Zoology section was held on 28th to the 31st of October 2002 at the Launceston Tram Shed.

It provided training and accreditation in the use of the agreed procedures for threatened fauna conservation under the forest practices system. Twenty-three participants from across the forestry industry attended the training course, while a further 3 attended only the final assessment day.

The course was designed to include technical as well as practical components, including issues such as the management requirements of Tasmania's forest dependent fauna, application and use of the available planning tools, introduction to general fauna (both invertebrates & vertebrates) and species specific information.

Specialists from a range of industries including zoologists from the Threatened Species Unit (DPIWE), Inland Fisheries Service, University of Tasmania, as well as the FPB and independent consultants provided background information on a broad range of forest dependant fauna. Dr Alastair Richardson (Uni. of Tas.)

provided an excellent overview of the terrestrial invertebrate fauna of Tasmania, followed by an entertaining look into Tasmania's aquatic invertebrate fauna presented by John Gooderham (Uni. of Tas.). The ever popular wedge-tailed eagle talk, conducted by Bill Brown (DPIWE), was complemented by the sound effects of the newly listed masked owl (presented by Dr Phil Bell). Also on offer were the old standards, burrowing crayfish (Dr Niall Doran, TSU and Scott Livingston, Tas Land and Forest), stag beetles and hydrobiid snails (Karen Richards, FPB), frogs (Raymond Brereton, FPB), fish (Dr Jean Jackson, IFS), the grey goshawk (Suzette Wood, FPB), snails (Kevin Bonham) and mammals (Billie Lazenby, DPIWE). Billie, through her work with the Fox Taskforce, was also able to give an entertaining update as to the status of the fox in Tasmania. The award for the most popular presentation, however, must go to Todd Walsh (IFS) for his talk on the Giant

Freshwater Crayfish, if for nothing else but the enthusiasm he shows for his subject and the awesome live specimen brought along for show and tell.

Participants of the course enjoyed the mix of formal and practical aspects, the hands on experience, the live specimens as well as having the opportunity to meet many of the species' specialists for the first time. The field sessions offered a chance for participants to learn first hand about particular species habitats and discuss different issues with the FPB zoologists and other specialists.

Our thanks to all the specialists who gave up their time to present at the course and to all those who attended. A good time was had by all.

Congratulations to all 23 of the participants who successfully passed the course and have become Level A accredited fauna officers.

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Web sightings

A regular column on sites containing information on forest practices and management. We invite your suggestions (site address and short summary). The FPB does not necessarily endorse the content of the sites. We will try to maintain a balance of local, national and international sites.

www.forestry.crc.org.au

This is the web site of the CRC for Sustainable Production Forestry. The CRC is a collaborative venture between Australian forestry companies, the Commonwealth Government, State Government enterprises and Universities (including the University of Tasmania). This site provides details of current research and some major findings to date. Research focuses on a range of topics, such as genetic improvement, plant ecophysiology and plant-animal interactions. The CRC newsletter "Overstorey" can also be accessed on this site.

<http://bioforest.ucc.ie>

The article by Sarah Munks on forestry in the UK and Ireland (page 16 of this issue) may have stirred your interest in current forestry practices in other areas of the world, and attitudes to plantations in particular. If so, here is a website where you can find out more about one particularly interesting current project in Ireland. Bioforest is a five year collaborative study aimed at building a picture of biodiversity in Irish plantation forest. This website gives the background to the current research and outlines the key objectives and methodology. The forest industry in Ireland is involved in the project. The findings are expected to guide future plantation development and forestry practices towards enhancement rather than reduction of biodiversity.

Fauna

Constraints on swift parrot breeding

Raymond Brereton, Senior Zoologist, Forest Practices Board

Brett Gartrell, an avian vet, has recently completed a PhD study looking at the nutritional and physiological constraints on reproduction in the endangered swift parrot (*Lathamus discolor*). Brett described the annual reproductive cycle by examining reproductive hormonal changes in both captive and wild birds.

Reproductive development in wild swift parrots was found to begin after the birds migrated to their breeding habitat in Tasmania from mainland Australia. Male swift parrots commenced testes development and increased the plasma concentration of testosterone in all years of the study regardless of the food sources available. Reproductive activity in male birds peaked in October and November and then declined in late December and January and was associated with the moulting of feathers. However, in this period very few female swift parrots were reproductively active. The initiation of breeding in female swift parrots appears to be the major factor limiting reproduction in wild swift parrots. Further, the female birds appear to be limited in numbers. Based on examination of birds killed in window strikes and birds trapped by mist-netting there is a male sex bias (1.9:1) to the wild swift parrot population. The cause of the sex bias is unknown.

Brett also studied the breeding period of the swift parrot, including egg laying, egg incubation and chick rearing. The male swift parrot is solely responsible for feeding the female during incubation, and the female and the chicks for

the first two weeks after hatching. This period appears to be a bottleneck for food resources in the swift parrot's life history. To maintain the high demand for food, nesting must occur close to good foraging habitat.

Brett investigated the links between reproduction and nutrition in swift parrots. He examined the adaptations to nectar feeding that have evolved in the birds, the food

resources used in the breeding season and their ability to extract protein from ingested pollen. All provide evidence for the importance of the flowering of the Tasmanian blue gum (*Eucalyptus globulus*) in supporting the nutritional requirements of reproduction in swift parrots.

Brett concluded, "the population decline of the swift parrot is an indicator of the problems facing dry forests and woodlands in south-east mainland Australia and Tasmania. The swift parrot is a robust species with few health problems in the wild population. The species' nomadic life history and ability to survive on a variety of food sources ensures they are able to overcome most local variations in food supply. However, there are key stages in their life history where they appear to be, critically dependent on the variable food resource provided by the Tasmanian blue gum, in particular, the initiation of reproduction and the rearing of young. The recovery of this species will be dependent on the successful management of its habitat in all of its migratory range, but most critically, the grassy blue gum woodlands of south-east Tasmania".



Brett Gartrell examining a swift parrot.

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Travel log

European goshawks, dead wood and leprechauns: notes from a study tour of forest fauna conservation in England, Scotland and Ireland

Sarah Munks, Senior Zoologist, Forest Practices Board

In July 2002 I visited a number of colleagues in organisations involved in the research and conservation of fauna in the managed forests of England, Scotland and Ireland. This article is a summary of the notes I made from my visit.

A considerable amount of funding is being pumped into the rehabilitation and enhancement of forest biodiversity in EEC countries. In general, the principle being followed is that enhancement of mature forest structures across the landscape are important for the

important role of their plantations in contributing to biodiversity conservation. A number of innovative approaches to the management of plantations have been developed. These include retention of open spaces within a plantation node established on former grassland or open woodland, maintaining mature age stands and woody debris within newly regenerated stands, increasing rotation times and adopting silvicultural systems other than clearfelling, to promote understorey growth and retain canopy cover.

One 'working' forest where these approaches are being adopted is Kielder forest in the north east of England. This is the largest and oldest State-owned plantation forest in Britain and is managed by Forest Enterprise, the agency of the Forestry Commission entrusted with the management of the Forest Estate. The native vegetation and wildlife of Kielder has its origins in the post Ice-Age era 14,000 years ago. About 10,000 years ago the Border Hills, where Kielder is situated, were covered in native broadleaf forest (open forests of oak, ash, alder, elm, hawthorn and hazel, birch and Scots pine at higher altitudes), peat bogs and upland moorland. Forest clearance by humans began in the Iron Age with major clearance during the Roman occupation. There is evidence that some forest cover survived into the sixteenth century but by the early twentieth century, the landscape of Kielder was dominated by open, treeless hills with small remnants of native woodland.

Major afforestation of the area began in 1926 and by the 1970s

50,000 ha of cleared land had been planted with predominantly non-native conifers (e.g. 50% Sitka spruce, 24% Norway spruce, 11% Scots and lodgepole pine, 8% Japanese larch, 2% Douglas fir, 3% other conifers and 2% broadleaf species) with the original objective of providing a strategic reserve of timber against the possibility of future wars and as a source of employment in rural areas. This narrow original objective was broadened over the following years, and the other economic benefits the forest could provide were recognised by the government. The current aim is that the forest (as all State-owned forest in the UK) is managed sustainably to produce environmental social and financial benefits; the environmental quality and productive potential being maintained or enhanced. Kielder forest is currently being restructured to meet this modern aim. The current management strategy aims to convert the single-purpose, rather uniform plantation into a diverse structured forest with value for tourism and biodiversity as well as wood production. Current annual timber production is approximately 400,000m³. Eighty people are directly employed to manage the forest and there are about 180 contractors. Approximately 500,000 people visit the forest each year for its recreation values.

The mature conifer plantation at Kielder provides habitat for a number of threatened species e.g. nesting sites for the goshawk, forage areas for the red squirrel, refuge sites for the dormouse, food resource for the Scottish crossbill.



Active European goshawk nest in mature Sitka spruce plantation.

maintenance of fauna diversity and the general health of a forest. In the UK, ancient woodland areas are being restored. In addition, plantations in England and Scotland originally established to provide a timber reserve are being restructured to enhance environmental values, including fauna diversity. Studies in Europe show that there is increasing evidence that plantation forests can have value for both vertebrates and invertebrates. The Forestry Commission in the UK and Coillte in Ireland both recognise the

Travel log

A project officer is employed on a seasonal basis to survey the forest for sites that are critical for threatened species and are changeable from year to year (e.g. goshawk nest locations). The monitoring information collected by the project officer enables assessment of the performance of fauna conservation measures and informs decisions on future management strategies. Such surveys are only carried out on State Forest like Kielder. Private landowners do not have to survey for scheduled species prior to forestry activities on their land. However, if there is a known site (e.g. goshawk nest), then it must be protected. The major threat to raptor conservation, however, is persecution by game keepers and private landowners.

The innovative approaches to the management of plantations were also applied in another 'working' forest visited at Glentress in Scotland. The importance of deadwood for maintenance of biodiversity in forested areas is generally accepted by the industry following work by researchers at the Woodland Ecology Branch of the UK Forestry Commission in Edinburgh. This work found that the presence of late successional structures, such as deadwood, enhanced the biodiversity value of

a particular area of forest, including plantations. Deadwood management guidelines have been developed and are being implemented in the development of design plans for coupes.

In southern Ireland recent forestry development includes a policy of afforestation with the aim of enhancing environmental values of the landscape as well as to increase future wood production potential. A large amount of resources are being directed toward getting the plantation establishment right with respect to biodiversity enhancement and maintenance. A program of research (Bioforest program) has been funded to address this issue. It involves the development of protocols to assess fauna diversity (including the presence of leprechauns) at the forest block and coupe scale and the levels of structural complexity required. It includes a review of indicators of biodiversity used nationally and internationally (i.e. structural, compositional and functional) and the testing and tailoring of indicators to the Irish situation. The program will also provide information of use in evaluating the efficacy of any provisions for the maintenance of fauna diversity in areas where production forestry activities occur.

The foresters, forest ecologists and the wider community encountered in England, Scotland and Ireland envied Tasmania's extensive tracts of native forests. The general feeling was that the aesthetic and natural heritage value and hence eco-tourism potential of our native forests, both managed and reserved, should continue to be promoted to the economic benefit of the State. The loss of this current and future potential and the potential future costs involved in restoration activities to bring back lost values, such as those currently underway in the UK and Ireland should be avoided.

The experience in the countries visited has been that the greatest progress in achieving conservation outcomes occurs where research, policy, regulation, incentives and published guidance are made to work together effectively. This requires stakeholders working together and not solely to their own agenda. The Forest Practices System in Tasmania provides us with the opportunity to have this 'joined up' approach to assist achievement of ecologically sustainable forestry goals.

The comprehensive report on this study tour is available from sarah.munks@fpb.tas.gov.au.

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Small 3 ha coupe in continuous cover zone



Plantation landscape at Glentress with retained open spaces on streams.

Soils

Aeolian deposits and landslide risk

Peter McIntosh, Senior Soil & Water Scientist, Forest Practices Board

Kevin Kiernan, Senior Geomorphologist, Forest Practices Board*

On 12 November 2001 a landslide with a total volume of about 3000 m³ was noted within a one-year old forest plantation in former farmland at Cradoc near Huonville. The landslide was recent and had occurred following heavy rain over a few days (Figure 1). Any landslides on forested land are routinely inspected by Forest Practices Board scientists to determine why they happened, to assess future risks and to help foresters plan rehabilitation. So we inspected this landslide and tried to work out why it had occurred.

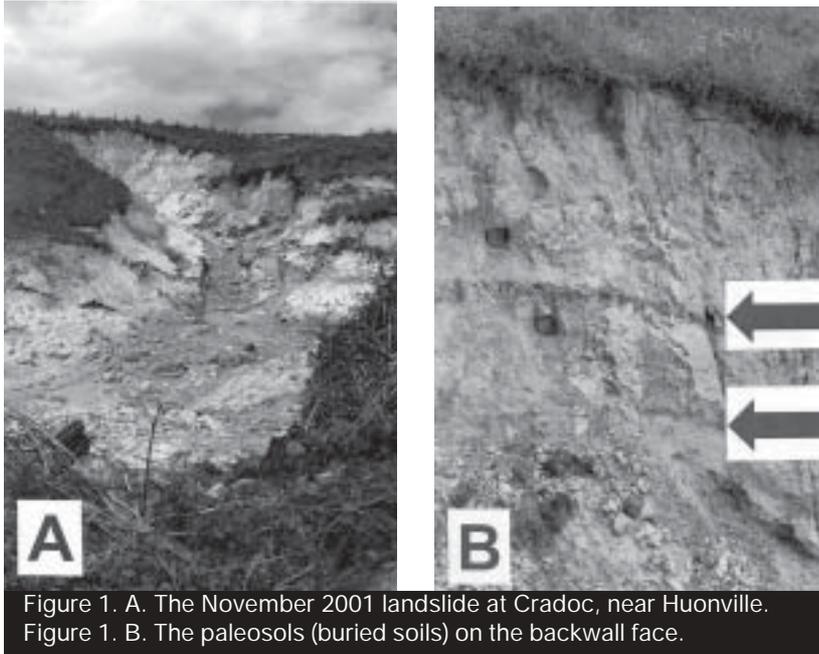


Figure 1. A. The November 2001 landslide at Cradoc, near Huonville.
Figure 1. B. The paleosols (buried soils) on the backwall face.

The landslide was unusual because it did not occur in a geological formation considered to be prone to landslides, such as basalt talus or mudstone. It occurred at the head of a gully containing a Class 4 stream. The surrounding soils were moderately deep sandy loams overlying hard sandstone. Fieldwork showed that forestry operations were unlikely to have contributed to instability: there had been no diversion of extra drainage water into the gully, and contour and spot cultivation had occurred according to *Forest Practices Code* guidelines. Because the area had been farmland for decades, recent removal of forest could not have caused instability. The question therefore remained: what had caused the gully deposits to collapse?

The sediments exposed in the 7 m high landslide headwall were

layered (Figure 1). The upper two sandy loam layers had the mottling pattern, prismatic structure and porosity typical of loess in New Zealand and elsewhere. (Loess is a deposit of fine sand or silt that has moved in suspension at high wind speeds and then settled out to form soils, sometimes metres thick). The darker layers visible in Figure 1 were clearly identified as buried soils, also called paleosols. (Buried soils in loess develop when loess accumulation stops for a time, allowing organic matter to accumulate at the soil surface). The layer below the lowermost paleosol had horizontal mottles and layering indicating that it was alluvium rather than loess, i.e. it was deposited by water. Sandstone outcrops were visible in gully sides.

After this field investigation the reasons for the landslide became

plain. Before the landslide occurred the topography was a gently sloping drainage depression. This feature concealed the very deep aeolian and fluvial deposits filling an ancient steep-sided sandstone gully. Under heavy rainfall the soils on the surrounding sandstone remained stable, but runoff from these soils accumulated in the drainage depression. As a result the alluvium at the base of the gully became water-saturated and fluid and started to flow (Figure 2). Catastrophic collapse of the overlying aeolian deposits occurred and a landslide resulted.

We decided to take the investigation a little further and try to date the sandy deposits. If the aeolian deposits turned out to be very recent then it could be reasonably assumed that the gully infill was the result of local erosion relating to previous land use and had no regional significance. However, if the aeolian deposits turned out to be very old, then they would be more likely to have been formed by some regional climate or erosion event. Such aeolian deposits could occur in other gullies of the lower Huon Valley, and could have similar landslide risk.

Carbon dating of root fragments in the first paleosol (at 4 m depth) gave an age of 215 +/- 64 years B.P. (before 1950). This date was considered to be suspect as the roots could have originated from surface trees that perhaps died after European land clearing 200 years ago.

To check on this date, the alternative method of thermoluminescence dating was

Soils

applied to the sandy deposits. This dating method relies on the fact that buried quartz crystals over time accumulate atomic imperfections as a result of background levels of radioactive bombardment, and that this crystal clock is "reset" when the quartz crystal are exposed to the overpowering energy of sunlight. If sediments are carefully sampled and stored in the dark, the accumulated energy stored in these crystal imperfections can be released. The energy stored is proportional to the length of time the quartz crystals have been buried and protected from sunlight. Therefore by measuring the energy released by the quartz, the time elapsed since burial can be calculated.

Four samples were submitted for dating to David Price at the University of Wollongong. Three dates have been obtained so far.

One sample from the lower half of the top deposit has been dated at approximately 27900 +/- 1300 years B.P. which is close to the beginning of the last stadial of the last glaciation. (Within glacial cold periods, stadials are the coldest periods lasting tens of thousands years, separated by relatively warmer periods of shorter duration, called interstadials). A sample from the second layer has been dated at 41400 +/- 2100 years B.P., which is in the penultimate stadial. A sample from the fluvial deposit at the base of the sequence gave an age of 28000 years which is inconsistent with the older age of the aeolian deposits above and is being checked.

These dates are sufficient to demonstrate that the aeolian deposits that collapsed forming the landslide are cold-climate deposits that accumulated during dry

glacial conditions. In the glacial climate the forest cover in the Huon Valley was probably less and the river itself occupied a wide floodplain that would have been periodically inundated by floods resulting from snow melt in the mountains of southwest Tasmania. Strong westerly winds would have carried fine sand and silt off the floodplain and deposited it downwind in protected gullies. (It has been established that during the last glaciation the climate was not only colder than at present but drier and windier). The old dates indicate a regional climatic event, and therefore similar deposits are likely elsewhere in the Huon District.

The message for foresters working in the lower Huon Valley is that gullies and drainage depressions on low-lying land need to be treated with extra respect. What looks like a gentle depression could conceal a much deeper and older feature that has become filled with sediments that may become unstable after heavy rain. These drainage depressions should not be cultivated and most importantly, extra water from roads and snig tracks should not be directed into them.

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* Kevin Kiernan has since resigned from the Forest Practices Board. Current address: Department of Geography and Environmental Sciences, University of Tasmania.

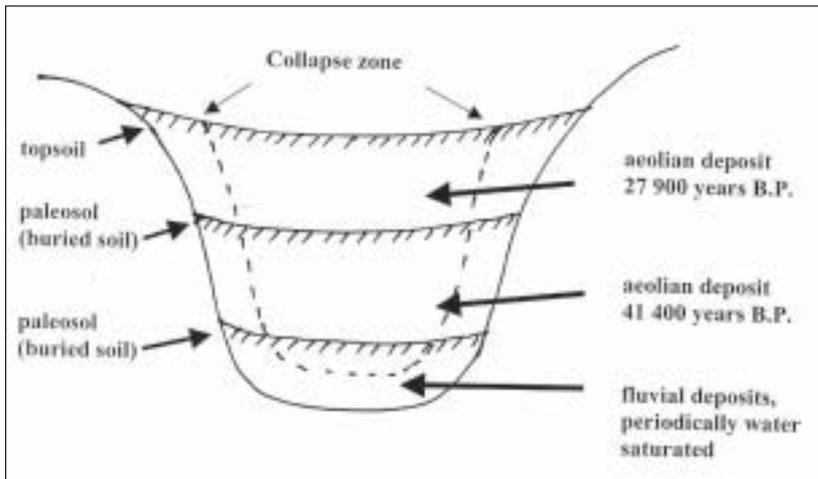


Figure 2. Diagrammatic representation of sandstone gully filled with fluvial and aeolian deposits.

Forest Practices Officers

 Are you moving?

To help us maintain an accurate database and to ensure that circulars reach you, please advise us if you are transferring, resigning, or retiring.

Thanks

Kylie and Sheryl – phone

(03) 6233 7966; email info@fpb.tas.gov.au

Kevin Kiernan exits the Forest Practices System

Kim Evans, Chair, Forest Practices Board

In November 2002, after 15 years with the Forest Practices Board, Kevin Kiernan left to take up a lecturing position at the School of Geography and Environmental Studies at the University of Tasmania.

Kevin's contribution to the Forest Practices system has been immense. He is perhaps best known for his karst expertise and raising awareness within the forest industry of the values and sensitivity of karst environments. To concentrate on karst would be unfair though, as Kevin, almost in spite of karst, also worked on mass movement, aeolian, coastal and volcanic processes. His love of cold climate processes encouraged his studies on the legacy of glaciation in our forests and ultimately led him to pursue research on the Antarctic mainland and Heard Island.

Kevin will be sorely missed. Not just for his fondness of cakes, Bob Dylan's music, midnight grovels in mud filled caves and practical jokes, but as a staunch defender of natural places that deserved the highest level of protection.

I am sure that all forest practices officers join the Board and its staff in thanking Kevin for his outstanding contribution to forest management and conservation. We wish Kevin all the best in his new position with the university.



The times they were a 'changin'... Kevin Kiernan pictured right in younger days, before being issued with hard hat, safety vest and boots. Photo: Greg Middleton

1988...

2002...

