

Can mature-forest biodiversity persist in production-forest landscapes?



# **Forest Practices Authority (FPA)**

The Forest Practices Authority (FPA) is an independent statutory body responsible for administering the Tasmanian forest practices system. The system regulates the management of forest and threatened non-forest vegetation on both public and private land.

The FPA employs specialists in botany, zoology, soil and water, geoscience and cultural heritage. The FPA conducts research and monitoring within the following programs:

- Biodiversity Program
- Earth Science and Cultural Heritage Program.

## Forest Practices News

*Forest Practices News* is a publication produced by the FPA which provides access to a series of articles highlighting a variety of research and monitoring projects along with insights into the other activities of the FPA.

The following article is an extract from *Forest Practices News* (May 2013 vol 11 no 4).

For further information and access to other articles please visit the FPA website (publications/ Forest Practices News): click here



# Can mature-forest biodiversity persist in production-forest landscapes?

Tim Wardlaw, Principal Scientist, Forestry Tasmania (left) Simon Grove, formerly Forestry Tasmania (right)

Are large nature reserves the only means of conserving forest biodiversity, or do smaller reserves, set-asides and production forests also contribute - and if so, by how much? The Regional Forest Agreements negotiated between the Commonwealth and individual states are based on the premise that the combination of reservation and complementary management by prescription outside reserves will conserve biodiversity right across the landscape and not just in large reserves. A recently completed study, commissioned by Forest and Wood Products Australia and involving scientists from Forestry Tasmania and the University of Tasmania, tested this premise in a landscape dominated by tall, wet eucalypt production forest.

Under natural conditions, tall, wet eucalypt forest landscapes are a mosaic of older and younger forests resulting from a long history of periodic and often intense wildfires. Species that are sensitive to disturbance can persist in such mosaics because they are able to occupy patches of long-unburnt mature forest, and to spread out from these patches into other areas recovering after wildfire. The study tested whether disturbance-sensitive species were also able to persist and recolonise regenerating forest in a production-forest mosaic.

The study was carried out in the Southern Forests Experimental Forest Landscape (SFEFL) – a 112 000 ha landscape of predominantly tall, wet eucalypt forest between the Huon Estuary and the Warra Long-term Ecological Research Site. The SFEFL provides a gradient in the intensity of disturbance in the surrounding landscape, shaped by past wildfires and by more than 150 years of European land-use. In the most disturbed parts of this landscape, 80 per cent of the vegetation owes its current structure and composition at least in part to commercial forestry operations or agriculture. In the least disturbed parts of the landscape nearly 90 per cent of the vegetation is unmodified by either forestry or agriculture.

Plots (56 in total) along this gradient were surveyed intensively to record the occurrence and abundance of species in three taxonomic groups – birds, vascular plants and beetles. Half the plots were in mature eucalypt forest (each patch at least 2 ha in extent) and half in 30–50 year-old forest regenerating after harvest. The study sought to find out if the ability of species



from these groups to persist in patches of mature forest – and to recolonise previously harvested forest – was the same in heavily modified landscapes as in largely natural landscapes.

"... the birds, plants and most beetles sampled have so far mostly been able to persist just as well in mature forest retained in heavily modified landscapes as in largely natural landscapes."

The study found that the birds, plants and most beetles sampled have so far mostly been able to persist just as well in mature forest retained in heavily modified landscapes as in largely natural landscapes. In the mature-forest plots in modified landscapes some beetle species were less abundant, and fewer beetle species were present in the most disturbed landscapes closest to the Huon Estuary, possibly a result of the scarcity in these disturbed landscapes of a key habitat – large logs on the forest floor. This scarcity probably reflects a history of more frequent wildfires, because these landscapes also



View from Glovers Bluff in the Southern Forests, showing a mix of disturbed and mature forest.



## Can mature-forest biodiversity persist in production-forest landscapes? (continued)

happen to be the warmest and driest parts of the SFEFL and closest to population centres.

The ability of the sampled mature-forest species to persist in mature eucalypt forest was largely independent of the intensity of disturbance in the surrounding landscape.

However, the ability of rainforest plants, dense-forest birds and some disturbancesensitive beetles to recolonise 30–50 year-old forest regenerating after harvest depended on the intensity of disturbance in the surrounding landscape: they were better able to recolonise regenerating forest where the surrounding landscape was less disturbed. Mature-forest species were more likely to have recolonised regenerating forest if they were close to mature forest and if the surrounding landscape contained more mature forest.

Used together, these two measures of maturity in the landscape can give us – if we can extrapolate from the study area – a good indication of how much mature forest would need to be retained in the landscape, and where, to ensure that our mature-forest species are able to recolonise forest regenerating after harvest. The study shows that many mature-forest species can persist in small reserves and in other areas of mature forest set aside in harvested areas. It has also indicated that some disturbance-sensitive species can recolonise forest regenerating after harvest provided there is sufficient mature forest in the surrounding landscape to act as a source for recolonisation.

'The study shows that many mature-forest species can persist in small reserves and in other areas of mature forest set aside in harvested areas.'

The study allows some evaluation of the conservation benefits arising from forest policy and regulations. In those parts of the SFEFL where commercial forestry activity largely began after the introduction of the *Forest Practices Code* in 1987 and the Regional Forest Agreement of 1997, the mature-forest species sampled have persisted in retained patches of mature forest and have been able to recolonise 30–50 year-old regenerating forest.

At the other extreme, in those parts of the SFEFL exposed to uncontrolled wildfires and first exposed to logging dating from the first half of the 20th Century (long before policies and regulations were in place), the landscape appears to have been less resilient. However, even in these parts of the SFEFL, the introduction of the Forest Practices Code and the Regional Forest Agreement has seen areas of younger eucalypt forest reserved or set aside for long-term retention. If these areas can be protected from wildfire then they should provide future mature forest that will enable mature-forest species to persist and recolonise other areas.

### Author's contact:

Tim.Wardlaw@forestrytas.com.au

#### Reference:

Note: this article is a summary of the following FWPA report:

Wardlaw, T, Grove, S, Balmer, J, Hingston, A, Forster, L, Schmucki, C, Read, S 2012, Persistence of mature forest biodiversity elements in a production forest landscape managed under a Regional Forest Agreement, PNC142-0809, Forest and Wood Products Australia, Melbourne.