Defining and managing oldgrowth forests

Amelia Koch, Anne Chuter & Sarah Munks

Forest Practices Authority, Hobart

Preamble

This document is a discussion paper on the definitions of oldgrowth, current management of oldgrowth forests and ecological issues arising from focusing forest management on oldgrowth. The content of this paper was developed from the experience and knowledge of the authors, whose opinions and interpretations are presented in the unreferenced material. This document also outlines a proposed approach to managing mature habitat (including oldgrowth).

The information presented is a broad overview of information considered relevant (by the authors) to the brief. Analysis and discussion of these issues have been undertaken to different levels of detail but the coverage of material is necessarily incomplete. This document meets the following deliverable:

- *Provide a brief report on 'oldgrowth' including problems arising from the current definition (mid January). This report will contain details of the approach being developed by the FPA to retain and promote the rehabilitation of structural oldgrowth elements (especially hollows) within the landscape.*

Defining and identifying oldgrowth forest

Attributes of oldgrowth forests in Australia are many and varied and include structural and compositional properties (e.g. large trees and the presence of hollows or fallen logs), functional properties (e.g. nutrient cycles and high litter levels in dynamic equilibrium) and ancillary properties (e.g. aesthetics and public perceptions) (Burgman 1996). While it has been argued that the definition and method for identifying oldgrowth forest should vary between forest types (Burgman 1996), a single definition is generally applied for a particular purpose (although numerous definitions exist).

The Tasmanian Regional Forest Agreement uses the definition for **oldgrowth** provided in the JANIS report, which is:

> *'Oldgrowth forest is ecologically mature forest where the effects of disturbances are now negligible' (JANIS 1997).*

During the assessment of environmental values undertaken as part of the RFA process, oldgrowth forest areas were identified from photo-interpretation (Stone 1998) and field validation. The criteria used to delineate forest age were growth stage, crown attributes and crown cover of the upper stratum. The presence and extent of disturbance were identified from signs of disturbance visible from aerial photographs, timber harvesting history, fire, grazing information and biophysical naturalness (RFA Background Report C).

Forest managers generally define forests according to the growth stages of the trees. Growth stages can be based on tree height, diameter, age and form (Jacobs 1955; Wardlaw et al. 2009; Wilkinson 1994). As trees gain height and start to get deeper crowns, they are referred to as '**regrowth**' (often about 110 years of age; Wardlaw et al. 2009; Wilkinson 1994). As the crowns deepen, and then start to retract, trees are referred to as '**mature**' (Wardlaw et al. 2009). While the tree crowns are retracting and the trees start to senesce, then trees are referred to as '**over-mature**' (Wardlaw et al. 2009). The term 'over-mature' may be considered equivalent to the term 'oldgrowth' (although sometimes both 'mature' and 'over-mature' trees are referred to as 'oldgrowth', Wilkinson 1994).

The general public do not necessarily use a strict definition when classifying an area as 'oldgrowth'. Members of the public may refer to trees that are mature, or areas that contain some mature or over-mature trees as 'oldgrowth', regardless of disturbance history.

Current management of oldgrowth forest

In 2005 the Tasmanian Community Forest Agreement committed the State to the additional protection of over 170 000 hectares of forest on public and private land and to increase the protection of oldgrowth forest to more than one million hectares (Commonwealth of Australia and State of Tasmania 1995).

In total, more than one million hectares of oldgrowth forests are in formal reserves and will not be subject to harvesting activity of any kind. At the time the Community Forest Agreement was signed, 12% of the total area of oldgrowth forest in Tasmania was in areas of State forest that were available for wood production, and the annual rate of harvest was small (0.2% per annum of Tasmania's total oldgrowth forests) (Commonwealth of Australia and State of Tasmania 1995). More recently Forestry Tasmania has developed an alternative silvicultural method to clearfelling for the harvest of oldgrowth forest. The alternative method is known as aggregated retention and involves leaving islands of unharvested forest throughout the harvested area (Baker & Read 2011).

Under the forest practices system, areas of oldgrowth forest on private land are managed by prescription. A number of forest communities have been recognised through the RFA process as being a priority for conservation if they meet the definition of oldgrowth.

Issues arising from focusing management on oldgrowth forests

Disturbance is an important ecological process in native forests. It helps provide habitat for the myriad of species that rely on the habitat changes that occur after disturbance. Oldgrowth forest in wet eucalypt forest is part of ecological succession, is not static and cannot be maintained indefinitely through reservation alone (JANIS 1997). Oldgrowth wet eucalypt forest will eventually turn into rainforest in the absence of disturbance.

Many areas that are not classified as oldgrowth have features typical of mature forest (e.g. hollows, large coarse woody debris). Focusing management only on areas that are currently classified as oldgrowth means that extensive areas that provide important mature habitat are overlooked, and will not ensure that a perpetual supply of mature forest features are maintained into the future.

It is important to disperse retained areas across the landscape to ensure habitat is provided for multiple species with limited dispersal abilities. If reserves focus on oldgrowth forest they will be biased to being located in particular areas. Forests which typically experience more frequent disturbance (e.g. dry sclerophyll forest) are likely to be excluded. However, the mature features in these disturbed areas provide important habitat for many species (Koch et al. 2008).

Management of structural diversity including the retention of mature forest elements, rather than just oldgrowth forest, would more closely align forest management in wood production areas with natural ecological patterns.

Proposed approach to managing mature forest via the Tasmanian forest practices system

Forests are classified as mature when they are about 110 years old and begin to develop structural features typically found in older forests. Features important for biodiversity that are found in mature forest include large spreading crowns, tree hollows and coarse woody debris. The time required to form mature-forest features is generally substantially longer than the average time between timber harvesting operations at a particular site. Careful management of mature forest is therefore required to ensure that these features are available for native species both now and into the future.

Given the diversity of species that depend on mature-forest features, management of mature forest needs to be applied across different spatial scales (e.g. at the landscape and coupe scales). The need for landscape-scale management of particular mature-forest features, such as tree hollows, was highlighted in the recent review of the biodiversity provisions of the Forest Practices Code (Biodiversity Review Panel 2009).

The Forest Practices Authority (FPA) has been developing an approach to managing mature forest in areas covered by the forest practices system. This approach is in the development stage and is currently being trialled. The objective for mature habitat management is based on the objective for tree hollow management recommended by the 2009 review of the biodiversity provisions of the Forest Practices Code:

> *To ensure a continued supply of mature trees at multiple spatial scales, such that populations of species dependent on mature forest features (e.g. hollows and coarse woody debris) are maintained across their range.*

The proposed approach aims to assess both the abundance and distribution of mature habitat at the landscape scale. The assessment is done using the Mature Habitat Availability Map, which is a spatial layer that categorises land as high, medium, low or negligible mature habitat availability, or areas not considered because they are native vegetation communities that have minimal eucalypts (e.g. rainforest). The proposed approach focuses on areas containing eucalypts because eucalypts contain special features important for biodiversity (e.g. eucalypts are prone to forming tree hollows, which provide important habitat for fauna). The approach delivers recommendations for coupe planning, taking into account the availability of mature habitat in the surrounding landscape.

The proposed approach assesses the proportion of the landscape that is comprised of high or medium mature habitat availability (again, the landscape unit excludes some native vegetation communities with a minimal eucalypt component - this is referred to as the 'corrected' area). If 30% of the corrected area within a 5km radius of an operation is high or medium mature habitat, then the *abundance* of mature habitat is considered to be adequate in that landscape. If 20% of the corrected area within a 1km radius of an operation is high or medium mature habitat, then the *distribution* of mature habitat is considered to be adequate in that immediate area. The amount of mature habitat retention required for an operation will depend on whether these thresholds are met. If both are met, then no additional retention is required for the planned operation. If only one of the thresholds is met, then different prescriptions apply, which largely ask that 20% of the area within the 1km radius be retained in the long term (long term retention is currently defined in the draft approach as being at least 110 years, or at a point that is agreed by both industry and the forest regulators). The areas to be retained are selected according to the quality of mature habitat they contain, which will allow recruitment of mature habitat in areas where it is scarce. If neither of the thresholds are met, then all areas of high or medium mature habitat availability are recommended for retention, potentially with additional retention of areas for recruitment (if less than 20% of the coupe is retained as mature habitat). See Appendix 1 for a summary of the proposed approach.

To date a draft technical note outlining this proposed approach has been produced, and this technical note has been trialled by a small number of practitioners. The map of mature habitat, on which this approach is based, has been produced and refined. An on-line tool has been developed which can be used by practitioners to perform the necessary calculations on habitat availability (see the habitat context assessment tool at www.fpa.tas.gov.au). Currently under debate is the threshold levels used in the proposed approach and the implications of applying the approach.

Bibliography

Baker, SC & Read, SM 2011, 'Variable retention silviculture in Tasmania's wet forests: ecological rationale, adaptive management and synthesis of biodiversity benefits', *Australian Forestry*, vol. 74, no. 3, pp. 218-32.

Biodiversity Review Panel 2009, *Review of the biodiversity provisions of the Tasmanian Forest Practices Code*, Unpublished report to the Forest Practices Authority, Hobart.

Burgman, MA 1996, 'Characterisation and delineation of the eucalypt old-growth forest estate in Australia: a review', *Forest Ecology and Management*, vol. 83, pp. 149-61.

Commonwealth of Australia and State of Tasmania 1995, *The Tasmanian Community Forest Agreement. Supplementary Tasmania Regional Forest Agreement*, Commonwealth of Australia and State of Tasmania, Canberra.

Jacobs, MR 1955, *Growth habits of the Eucalypts*, Forestry and Timber Bureau, Canberra.

JANIS 1997, *Nationally Agreed Criteria for the Establishment of a Comprehensive, Adequate and Representative Reserve System for Forest in Australia*, Commonwealth of Australia, Canberra.

Koch, AJ, Munks, SA & Woehler, EJ 2008, 'The hollow-using vertebrate fauna of Tasmania: distribution, hollow requirements and conservation status', *Australian Journal of Zoology*, vol. 56, pp. 323-49.

Stone, MG 1998, 'Forest-type mapping by photo-interpretation: A multi-purpose base for Tasmania's forest management', *Tasforests*, vol. 10, pp. 15-32.

Wardlaw, T, Grove, S, Hopkins, A, Yee, M, Harrison, K & Mohammed, C 2009, 'The uniqueness of habitats in old eucalypts: contrasting wood-decy fungi and saproxylic beetles of young and old eucalypts', *Tasforests*, vol. 18, pp. 17-32.

Wilkinson, G 1994, *Native Forest Silviculture Technical Bulletin No. 5*, Forestry Commission, Tasmania.

Appendix 1. FPAs proposed approach to managing mature habitat in areas covered by the forest practices system

Using the FPA Mature Habitat Availability Map, will more than 30% of the area within a 5km radius of the central coordinates of the planned operation be comprised of high or medium mature habitat availability after the proposed operation is harvested?

Yes

Using the FPA Mature Habitat Availability Map, will more than 20% of the area within a 1km radius of the central coordinates of the planned operation be comprised of high or medium mature habitat availability after the proposed operation is harvested?

No

Using the FPA Mature Habitat Availability Map, is more than 20% of the area within a 1km radius of the central coordinates of the planned operation be comprised of high or medium mature habitat availability?

Yes

Rec 1. No additional retention specifically for mature habitat is required

No

Using the FPA Potential Hollow Availability Map, is more than 20% of the area within a 5km radius of the central coordinates of the planned operation comprised of high or medium potential hollow availability?

Rec 3. All areas of high or medium mature habitat availability, as determined from the Mature Habitat Availability Map or on-site assessments, should be retained.

No

Yes

Rec 4. Areas of high or medium mature habitat availability, as determined from the Mature Habitat Availability Map or on-site assessments, should be retained up until 20% of the planned operation area.

Rec 5. All areas of high or medium mature habitat availability, as determined from the Mature Habitat Availability Map or on-site assessments, should be retained. Additional areas may also need to be retained for long-term retention to allow for recruitment of mature forest features. The additional area to be retained for recruitment should be of a size to ensure that (1) 20% of the planned operation area is designated for retention or recruitment of mature forest features, or (2) 20% of the area within a 1km radius is comprised of high or medium mature habitat availability or is designated for long-term retention and recruitment of mature forest features. [Note: more than 20% of the coupe area may need to be retained due to retention of areas of high and medium mature habitat availability, but in these circumstances no additional retention for recruitment is required]. The mature habitat recruitment calculator, available on the FPA website, can be used to determine the area to be retained for recruitment.

Using the FPA Mature Habitat Availability Map or on-ground assessments, is at least 20% of the planned operation comprised of high or medium mature habitat availability?

Yes

No

Rec 2. 20% of the planned operation area must be retained in areas comprised of high or medium mature habitat availability. Areas of high mature habitat availability should be preferentially selected for retention.