

Arboreal Marsupials on New England wool properties

Why are arboreal marsupials important?

Arboreal marsupials are possums, gliders and their relatives, which live mainly in tree canopies. They fulfil an important role in farmland timber—the natural control of dieback-causing insects and parasitic mistletoes. Timber is important in providing shade and shelter for livestock and pasture productivity. Both dieback and mistletoes can debilitate and kill farm trees.

Arboreal marsupial species vary in their diet, so a range of species offers a more comprehensive natural pest control service.

How many different kinds are there?

Australia-wide, there are about 25 species of arboreal marsupial, most of them in eastern Australia. About ten species occur in New England.

The Land, Water & Wool (LWW) Northern Tablelands Project (2002-06) (NSW) recorded four species of arboreal marsupial on southern New England wool properties over two summers (Table 1).

Are they widespread?

Arboreal marsupials are still present on most New England wool properties (Table 2). The LWW Northern Tablelands Project recorded arboreal marsupials on 16 (89%) of 18 wool properties in summer 2004-05.

Common brushtail possums were found on most farms with dense timber (Table 2). They also occurred less frequently in scattered timber over pasture and occasionally in riparian woodland.

Common ringtail possums occurred on about a third of properties, in dense and riparian timber. Sugar gliders and koalas occurred on about 20% of properties, mainly in dense timber.

No arboreal marsupials were detected in young windbreaks, 10-15 years old, planted to native or mixed native and introduced trees and shrubs.

Are they common?

Common brushtail possums are the most abundant arboreal marsupial on New England farms, with an average of 2 brushtails/ha in dense timber (Fig. 1). In our research, occasionally up to 8-10 brushtails were encountered in denser timber in survey plots, 1.2 ha in size.

Common ringtails are not as frequently encountered but occur at average densities approaching 1 ringtail/ha in dense timber (Fig. 1). Up to 4-6 ringtails together were encountered in dense



Above—Common brushtail possum. Brushtails often come down to the ground to graze green pastures and clovers on farms. Photo—Stuart Green.

timber in survey plots.

Sugar gliders and koalas were only encountered occasionally and as single individuals. However, sugar gliders are not as effectively sampled by spotlight as the larger possums. The home range of koalas in New England is also much larger than the survey plots (1.2 ha) used in our research. Therefore both these species may be more abundant or widespread than the data suggest.

Table 1. The arboreal marsupials recorded by the LWW Northern Tablelands Project on 18 Monitor wool properties in the summers of 2002-03 and 2004-05.

Common Name	Latin Name	Diet*	Abundance**
Common brushtail possum	<i>Trichosurus vulpecula</i>	Leaves, flowers and fruit including mistletoe foliage, flowers and fruit	0.72
Common ringtail possum	<i>Pseudocheirus peregrinus</i>	Eucalypt leaves and flowers, foliage, flowers and fruits of other species including mistletoe leaves	0.27
Koala	<i>Phascolarctos cinereus</i>	Almost entirely eucalypt leaves	0.06
Sugar glider	<i>Petaurus breviceps</i>	Wattle exudates and green seeds, nectar, pollen, eucalypt exudates, and invertebrates and their exudates	0.05

* Sources: Strahan (1995), Reid (1997).

** Average number per hectare recorded in surveys of a total of 63.6 ha of wooded habitats over 17.7 hours across 18 farms in summer 2004-05.

Table 2. Percentage occurrence of arboreal marsupials in wooded habitats on New England wool properties in summer 2004-05. Wooded sites, 1.2 ha in area, were surveyed at night by spotlight for 20 person-minutes.

	Sample Size	Common Brushtail Possum	Common Ringtail Possum	Sugar Glider	Koala	All Species
Properties	18	83%	33%	22%	17%	89%
Young windbreaks	10	0%	0%	0%	0%	0%
Scattered trees*	17	24%	0%	0%	0%	24%
Dense timber**	16	88%	31%	19%	19%	94%
Riparian timber	10	10%	20%	10%	0%	30%

* Projected foliage cover of trees < 10%.

**Projected foliage cover of trees ≥ 10%.



Above—A common brushtail possum selecting mistletoe foliage over host eucalypt foliage in an experimental (cafeteria) trial. Photo—John Choate.

Hollow trees (both dead and living) are important roost and breeding sites for possums and gliders. Ringtail possums also build spherical nests ('dreys') of bark and leaves in tall shrubs or inside mistletoes.

Possums and mistletoes

Common brushtail possums and common ringtail possums both prefer mistletoe foliage or flowers and fruit to eucalypt foliage at certain times of the year. They can therefore defoliate mistletoes and reduce mistletoe seed production, helping keep mistletoe numbers in check.

Although mistletoe is an important food, roost and nest resource for many species of birds, insects and marsupials, too much mistletoe can damage farm trees. Healthy possum numbers help ensure a balance between trees and mistletoes.

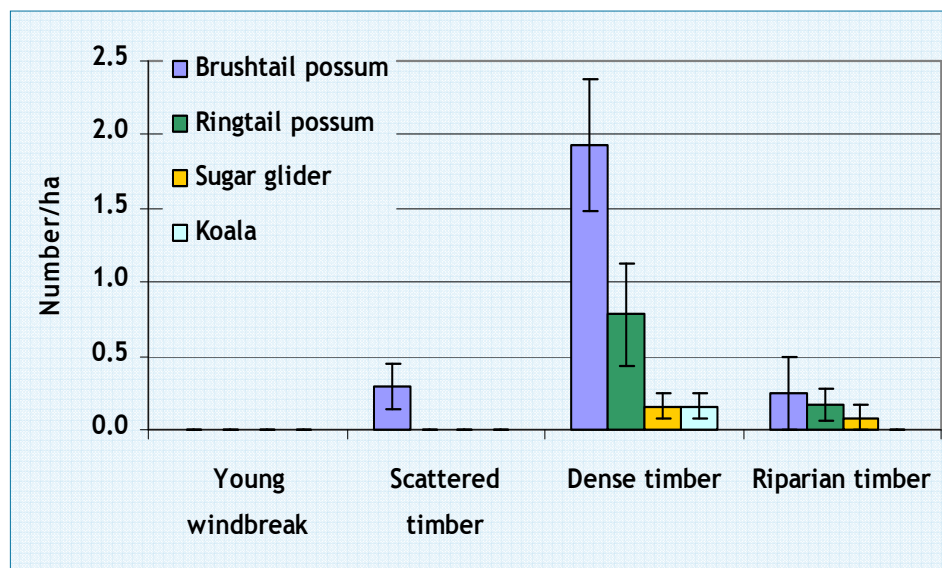
One of the explanations for increasing mistletoe abundance in scattered farm trees is the decline in possum numbers due to loss of tree cover, loss of hollow trees, the prevalence of foxes and the susceptibility of brushtails to 1080 poisoning.

Sugar gliders and dieback

Sugar gliders are the main predator of large adult scarab beetles in New England eucalypts, consuming up to 15 beetles per hour on summer evenings when both beetles and sugar gliders are active. Sugar gliders and insectivorous birds keep insect numbers under control in healthy timber, but insect numbers in dieback-affected timber can be ten times greater than in unaffected stands.

Sugar glider densities vary with the abundance of their winter food plants, particularly the exudates produced by certain wattles (*Acacia* spp) and the sap of apple box (*Eucalyptus bridgesiana*) trees. Sugar glider numbers vary ten-fold in proportion to the abundance of exudate-producing wattles amongst timber. So where wattles and apple box are abundant, sugar gliders can play an important role in the recovery of dieback-affected timber (Smith undated).

Figure 1. The average density (± 1 s.e.m.) of arboreal marsupials in different wooded habitats on 18 New England wool properties, summer 2004-05.



Key habitat elements on your farm

Food plants

Possums and koalas need a variety of food plants throughout the year for a balanced diet. They also need corridors of woody vegetation through the farm landscape in order to be able maintain contact with others of their species.

The preferred food trees of koalas on New England farms are silvertop stringybark (*Eucalyptus laevopinea*), apple box (*E. bridgesiana*), ribbon gum (*E. nobilis*), white gum (*E. viminalis*), New England peppermint (*E. nova-anglica*), messmate (*E. obliqua*), mountain gum (*E. dalrympleana*) and New England stringybark (*E. caliginosa*).

Possums eat a wider variety of tree and shrub foliage, flowers and fruits than koalas, and their preferred food plants vary throughout the year. Thus a diversity of trees and shrubs is important for both brushtail and ringtail possums. Both adapt well to urban environments where much of the vegetation may be introduced.

Key winter food plants for sugar gliders in New England are the exudate-producing wattles such as fern-leaf wattle (*Acacia filicifolia*), silver wattle (*A. dealbata*) and other species with bipinnate foliage on the Northern Tablelands, as well as apple box trees (for sap).

Roost and nest sites

Hollow trees (both dead and living) are important roost and breeding sites for possums and gliders. Ringtail possums also build spherical nests ('dreys') of bark and leaves in tall shrubs or inside mistletoes.



Above—A common ringtail possum. These are present in denser timber on New England wool properties, but are not as common as brushtails. They are particularly fond of creeping mistletoe (*Muellerina eucalyptoides*) in winter. Photo—Karl Vernes.



Above—Christmas beetles devouring the foliage of a young white gum (*Eucalyptus viminalis*) at 'The Hill', one of the Case Study properties in the LWW Northern Tablelands Project. Sugar gliders eat adult Christmas beetles in summer.



Above—A sugar glider. Mature eucalypts provide hollows for gliders to roost in by day. Photo—Stuart Green.



Above—A strip of uncultivated bushland, recently fenced off and managed as a wildlife corridor on the boundary of 'Blaxland', an LWW Monitor farm. Silver wattle (*Acacia dealbata*) and Blakely's red gum (*Eucalyptus blakelyi*) are starting to regenerate naturally in the absence of livestock.



Above—A koala seeking refuge in a deciduous tree by day. Photo—Karl Vernes.



Above—Box mistletoe (*Amyema miquelii*) on Blakely's red gum. Common brushtail possums selectively eat the flowers and fruits of box mistletoe, limiting mistletoe spread. However, scattered trees are difficult for possums to visit without heightened risk of predation.

Improving habitat for arboreal marsupials on farms

Remnant timber

Timber needs to be managed to conserve its habitat value for arboreal marsupials. This means ensuring the survival of the many tree and shrub species that occur naturally in woodland and forest.

Even light grazing (1 DSE/ha) of timber by sheep can eliminate young trees and shrubs. Where remnant timber on New England farms has been grazed by domestic stock since settlement, much of the understorey layer of shrubs and small trees is gone.



Wooded riparian zone



Dense timber



Windbreaks



Scattered trees

Denser and distant areas of timber can be fenced and spelled from livestock grazing for 5-10 years or plan-grazed to see whether natural regeneration of wattles, other shrubs and small trees, and eucalypts occurs.

Alternatively, since the hard seed of wattles may last 50 years in the soil after the death of the parent tree, fire may be used to promote wattle regeneration. The fire must be moderately intense to crack the hard seed. Burnt areas must be fenced and grazing managed, since small wattles, casuarinas and other understorey species are highly palatable to sheep.

If neither livestock exclusion nor fire promote natural regeneration, then re-planting the understorey is a good option enabling a wide variety of desirable species to be established. Because of the palatability of small trees and shrubs to sheep, understorey plantings need to be fenced from stock much or all of the time, and grazing has to be carefully managed.

Expanding the area of timber

All other things being equal, larger areas of timber support more species of arboreal marsupial than small stands. Therefore, natural regeneration or revegetation with trees and shrubs can be managed to increase the size of existing stands of timber on farm, and provide more habitat for possums, gliders and koalas.

Tree hollows

Possums and gliders sleep by day in the hollow branches and trunks of large old trees. Ringtail possums often build their dreys in hollows. At least four dead or living hollow trees per hectare should be left in farm timber for refuge.

Wildlife corridors

All four species of arboreal marsupial on New England farms must come down to the ground to move between trees or stands of timber. However, they are vulnerable to foxes, cats and dogs away from trees. Linking up existing timber with dense plantings of trees and shrubs or belts of naturally regenerated timber reduces the risk of predation and enables safer passage, as well as providing shade and shelter for livestock and pastures.

Natural corridors in the landscape such as uncleared road reserves, streams and creeks are good areas to start with, in planning wildlife corridors within and between farms.



Land, Water & Wool (LWW) is the most comprehensive natural resource management research and development program ever undertaken for the Australian wool industry. LWW is a partnership between Australian Wool Innovation Limited and Land & Water Australia, and has seven core sub-programs. The Native Vegetation and Biodiversity sub-program is working with woolgrowers and demonstrating that biodiversity has a range of values, can add wealth to the farm business and can be managed as part of a productive and profitable commercial wool enterprise.

The Land, Water & Wool Northern Tablelands Project is led by Associate Professor Nick Reid, University of New England, in collaboration with Southern New England Landcare Ltd, and the Centre for Agricultural and Regional Economics.

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References

Reid N. (1997) Control of mistletoes by possums and fire. *Victorian Naturalist* 114, 149-158.

Smith A. (undated) Sugar gliders, wattles & rural eucalypt dieback. Ecosystem Management, University of New England, Armidale.

Strahan R. (1995) *The Mammals of Australia*. Australian Museum and Reed Books, Sydney.

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