



## Fire and nature, the burning question

**M**ore frequent and intense bushfires are predicted for Victoria in coming years, as our weather warms and dries and lightning storms increase.

This will affect terrestrial ecosystems in varied ways. Two of these ecosystems are discussed below, but the effects of increased fire on the many tens of thousands of Victorian native species remain scarcely understood.

### An ancient fiery relationship

Over the past 50 million years, since Australia broke away from Gondwana, fire has been part of the natural landscape. Since that time, most of Australia's remarkable plants and animals have evolved to live with fire, or even depend on it.

In the past 50,000 years or so, Aboriginal people have been using fire in the landscape for a variety of reasons such as keeping open the grassy woodlands of much of what is now Victoria.

There is little evidence, however, that pre-European Aboriginal communities habitually burnt the tall wet forests of eastern Victoria, or alpine regions.

This long fire history has left us with a remarkable and complex relationship between fire and biodiversity. Unfortunately, it is a relationship that is often trivialised in park management, with inadequate efforts to monitor and learn from the effects of wild or management burns, even the so-called "ecological burns".

### Mountain Ash forests

Standing in awe in a towering eucalypt forest is one of the great experiences natural Victoria offers.

Mountain Ash (*Eucalyptus regnans*) is the world's tallest flowering plant, and the tallest hardwood tree (trees can grow to over 500 years old, and over 100 metres).

At one time Victoria probably had the world's tallest trees, but the greatest giants have since been cut down or destroyed by fire. Mountain Ash are still common, though, in the tall, wet forest areas of the Otways, the Strzeleckis and Victoria's eastern highlands.

### How does fire affect them?

Mountain and Alpine Ash forests like very occasional



Future generations may never see our forest giants The Mueller Tree, a giant Mountain Ash near Healesville, was recorded as having a girth of 64 feet (19.5 m), and would have been many hundreds of years old when it fell in 1998. Victoria's forests were once rich with ancient Mountain Ash, but few truly old trees remain, and increased fire may kill the rest. Photo: A.D. Hardy (1935)

fire, but collapse when fires are frequent. Unlike most eucalypts, they are easily killed by bushfires but, paradoxically, they also generally need fire for regeneration.

The fire-killed trees drop lots of seed, and new seed-

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lings grow prolifically in the sun-drenched bed of ash.

Importantly, the young seedling trees do not produce seed for about 10-15 years, so if a fire comes again within 10 years of a previous fire, there is no regrowth, and the Mountain Ash forest can be replaced by trees like Silver Wattle.

Also, if a fire happens within about 50 years, the trees will not be old enough to produce hollows, which are essential for a great range of birds, mammals, bats and insects.

The relationship of such forests to fire gets even more complex when we look at individual species of birds or mammals, which often require specific understory species or even certain fungi.

These relationships, so critical to biodiversity, are seldom studied and rarely monitored.

The 2003 fires in eastern Victoria were overlapped, in some areas, by the 2005 fires, and some extensive areas of Mountain Ash forest regrowth were destroyed.

Victoria's main protected water catchments are largely old, long-unburnt Mountain Ash forests.

## Rainforests

Victoria's pockets of rainforest are extremely vulnerable to fire. Rainforests are remnants of the old Gondwanan forests, widespread before Australia separated from Gondwana. The "typical Australian flora" (eucalypts and many other fire-tolerant plants) has evolved since then.

Today in Victoria rainforests mostly inhabit the deep, shady streamside valleys of tall wet forests, where they are protected from fire. There are two main types of rainforest in Victoria:

- **Warm-temperate:** mostly found in East Gippsland lowland forests, this typically has Lillypilly, Pittosporum or Kanooka trees, often with jungle-like tangled vines.
- **Cool-temperate:** with lots of tree-ferns, and mosses, fungi and lichens on the ground, Myrtle Beech rainforests can be found in the Central Highlands, the Strzeleckis and the Otways. At higher elevations in East Gippsland they are typically canopied by Sassafras or Black Oliveberry trees.

With climate change, the eucalypt forests that surround rainforests are likely to become drier, leaving the rainforests more prone to fire.

Just one bushfire can effectively destroy a rainforest, or leave it so depleted it will take many years to recover. Burnt rainforest is generally invaded by eucalypt forest.

## What's an old tree worth?

Fires can help the development of hollows in old trees, but regular or intense fires (and logging) can greatly



### Increased fire frequency and intensity has an impact on:

- Mountain and Alpine Ash in Great Otway, Tarra Bulga, Central Highlands, Wilsons Promontory, Alpine, Mount Buffalo, Baw Baw and Errinundra National Parks as well as State Forests.
- Rainforest in Great Otway, Tarra Bulga, Central Highlands, Wilsons Promontory, Alpine, Snowy River, Mitchell River, Baw Baw, Alfred, Lind, Errinundra, Coopracambra and Croajingolong National Parks, and State Forests.

reduce the number of trees of hollow-bearing age. Different species need hollows of differing size, shape and aspect.

The following list of some creatures that require hollows in Brisbane Ranges National Park was compiled by members of the Geelong Field Naturalist Club.

The asterisks identify species that act as significant plant pollinators, suggesting that reduced tree hollows can have impacts well beyond the species seeking shelter.

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|--------------------------------|---|
| - Sugar Glider*                | - Barking Owl                           |
| - Brush-tailed Possum*         | - Barn Owl                              |
| - Brown Antechinus*            | - Australian Owlet Nightjar             |
| - Brush-tailed Phascogale*     | - Laughing Kookaburra                   |
| - Yellow-tailed Black Cockatoo | - Sacred Kingfisher                     |
| - Sulphur-crested Cockatoo     | - White-throated Treecreeper            |
| - Galah                        | - Brown Treecreeper                     |
| - Little Lorikeet*             | - Striated Pardalote                    |
| - Purple-crowned Lorikeet*     | - Southern Whiteface*                   |
| - Musk Lorikeet*               | - Tree Martin                           |
| - Crimson Rosella*             | - Gould's Wattled Bat                   |
| - Eastern Rosella*             | - Little Forest Bat                     |
| - Red-rumped Parrot*           | - Lesser Long-eared Bat                 |
| - Powerful Owl                 | - White-striped Freetail Bat            |
| - Southern Boobook             | - Native bees and other invertebrates * |