



Fire, flora and fauna

Fossil evidence suggests that fire was a part of the Australian landscape long before the existence of human beings. Natural fires were caused by lightning, occasional volcanic activity or spontaneous combustion probably became more frequent as the Australian continent became drier. It appears that, with the arrival of humans over 50,000 years ago the frequency of fire may have increased. Aboriginal people used fire skilfully, managing various areas to sustain their own survival and that of future generations. They used fire as a tool for a variety of purposes such as hunting, warmth and cooking, to encourage grassland development in some areas and also to increase the abundance of plant foods and animals.

With the arrival of Europeans the fire regimes changed. Fires are now less frequent, but when they do occur they are more intense and often cause a lot of damage.

Fire and the bush Most of the dry forests and woodlands of eastern Tasmania have a natural fire cycle. The time between fires is largely influenced by the type of understorey.

The frequency of fires can also influence the structure of the vegetation by favouring or eliminating certain plants. If fires occur too frequently some species such as the Oyster Bay pine (*Callitris rhomboidea*) will be eliminated. Other species require fires to regenerate, such as the Tasmanian ray flower (*Cyphanthera tasmanica*). This rare plant, found at Freycinet, may disappear for years in the absence of fire and then germinate following a fire.

Many plants have interesting adaptations to fire, some of which include:

- eucalypt species produce shoots (known as epicormic) from burnt trunks and boughs. These shoots are eventually able to establish leaves, and so provide nourishment to the trees.
- Banksias and hakeas store seed in woody fruits which open as a result of fire. Consequently the seeds germinate and grow on the burnt ground with reduced competition from grasses and sedges.
- Grass trees (*Xanthorrhoea australis*) flower prolifically after fire due to a fire-initiated release of the gas acetylene, which initiates the growth of the flower spike and the early release of seed.

- Some native orchids only flower immediately after fire and sprout from bulbs which may have lain dormant in the soil for up to 20 years.
- Sclerophyll is a term used to describe plants with an adaptation for survival in extreme conditions. Adaptations includes leaves that are hardened, thickened and resistant to moisture loss, such as those of a eucalypt tree or the native heath. Most sclerophyll vegetation is also well adapted to fire

Fire sensitive communities

Since the arrival of Europeans, roughly one third of the Tasmanian highlands have been damaged by fire. In the last century over a quarter of Tasmania's rainforest has been burnt. The unique deciduous beech is just one species that can be lost from an area for thousands of years as a result of a single fire. The native conifers are highly susceptible to fire and take from several hundred to several thousands of years to regenerate.

Ironically, such fire-sensitive communities often occur beside highly flammable communities such as buttongrass moorland.

Fire and fauna

Fire plays an important role in shaping the habitat for many animal species. Like plant species, some animal species benefit from regular firing of their habitat whilst others are disadvantaged.

For example, the New Holland mouse, which lives in coastal heathland, increases in numbers soon after a fire has occurred. This is because seeds, the primary food source for this mouse, are released after fire. However, if another fire occurs before the new plants produce seed then the New Holland Mouse is left to survive without its primary food source. The pencil pine moth, on the other hand, is dependent on the pencil pines, which are highly vulnerable to fire. Fire kills this conifer and hence removes the moth's only habitat.

If fire were excluded from buttongrass moorlands long enough for rainforest to replace it, then species such as the broad-toothed mouse and the swamp antechinus would disappear from these areas. Such a change would see the habitat suited to species such as pademelons and long-tailed mice.

Some animals are able to survive fires, although an exceptionally intense fire can lead to the widescale loss of individuals. Arboreal (flying) mammals, such as pygmy possums and sugar gliders, can be killed by intense fires due to the loss of the tree canopy in which they live.

Less intense fires pose a much smaller risk to animal survival. Highly mobile species are able to move out of danger while birds and other flying species can fly away. Burrowing animals, such as the wombat, are often able to survive within their burrows. Similarly, some invertebrates can shelter underground. Hopping mammals such as Bennetts wallabies can bounce back through breaks in the fire front.

Advantages of fire

Fire can also create a rejuvenated habitat for many animal species. Herbivorous mammals like the fresh pickings associated with the regrowth that follows fire.

Within a week after buttongrass moorland has been burnt, the vegetation starts to regrow succulent shoots and attract herbivorous animals such as Bennetts wallabies, wombats and grasshoppers. However, these species, particularly wallabies and wombats, require nearby areas of unburnt habitat where they can shelter. Among bird species, the critically endangered orangebellied parrot prefers buttongrass moorland habitat which has been burnt recently.

Disadvantages of fire

Small mammals such as the swamp rat, broadtoothed mouse and swamp antechinus cannot survive in recently burnt buttongrass moorland as there is very little cover to provide protection from predators. They may have to wait five years or more before they can move back into these habitats.

The effect of fire on invertebrate populations is less well known. The rare Hickman's pygmy mountain shrimp (*Allanaspides hickmani*) lives in pools in buttongrass moorlands. If a fire in moorland is very intense and burnt into peat, this threatened species may also be affected. Some animals may survive a fire but then succumb to the loss of food, protective cover and nesting material.

How you can help

Many national parks and reserves throughout Tasmania have been declared, Fuel Stove Only Areas. This is because environmentally damaging bushfires can start from campfires and because firewood is often scarce in these areas, resulting in trees and habitats for animals being broken and burnt. Fines of up to \$5,000 can be imposed for lighting fires in Fuel

Stove Only areas.

If you see any fire please report it to a Ranger or to the Tasmanian Fire Service (phone 000).

Further information

Marsden-Smedley, J.B., Fire regimes in Southwestern Tasmania, pp 19, Papers & Proceedings of the Royal Society of Tasmania, Volume 132, 1998

Kirkpatrick, J.B., Tasmanian Native Bush: A Management Handbook; Tasmanian Environment Centre; 1991

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