

# Resource Notes

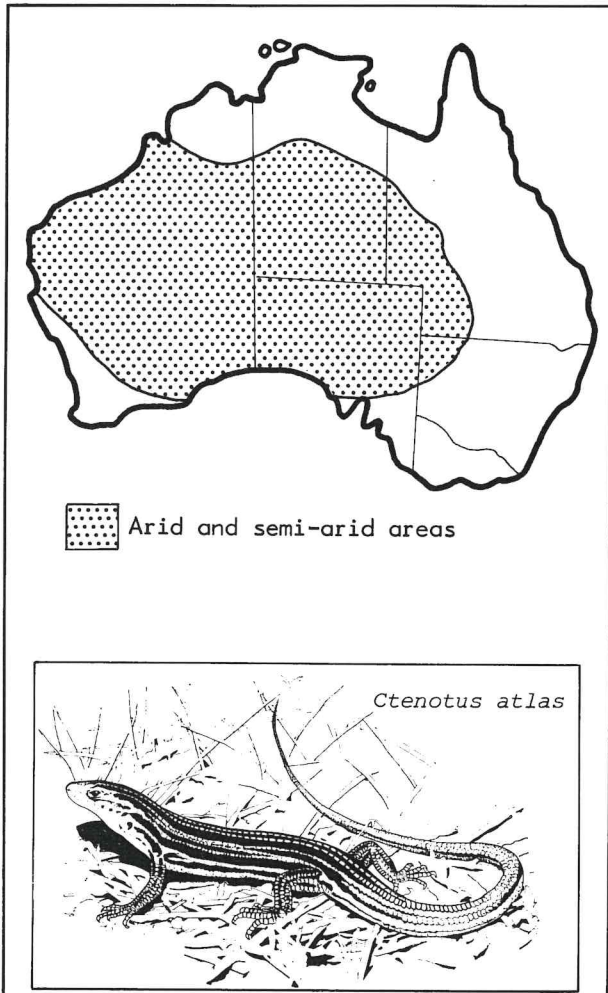
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## EFFECT OF FIRE ON REPTILES OF ARID AND SEMI ARID AREAS

Most Australian studies into the effect of fire on reptiles have been carried out in the arid and semi-arid spinifex and mallee country. Results show that the ability of animals to survive during and after a fire depends on their specific habitat and feeding requirements, and on the severity of the fire.



 Arid and semi-arid areas

*Ctenotus atlas*

During a fire in the semi-arid Goldfields area of Western Australia many surface-dwelling animals are probably killed. But those, such as the blind snake *Ramphotyphlops bituberculatus*, that are able to retreat to their underground burrows often survive - protected by the insulating property of the soil. Some species of skinks and geckoes also live in burrows and are able to avoid flames. Other skinks, such as *Ctenotus atlas*, shelter in clumps of spinifex, and so may be destroyed in a fire. However, as spinifex grows back a few years after a fire, the area is soon repopulated by surviving skinks from neighbouring populations. Litter dwellers seem to be the most affected by fire in the long term. The skink *Ctenotus schomburgkii* and the gecko *Diplodactylus intermedius* both live and feed amongst the layer of dead leaves and vegetation covering the ground. In arid areas this dry leaf litter provides an excellent fuel, and is rapidly consumed - along with its inhabitants - if it lies in the path of a fire. Because of the slow growth rate of plants in arid areas, it is many years before sufficient leaf litter builds up to provide adequate shelter for the litter dwellers.

These results suggest that as the structure of the habitat changes following fire, a natural succession of reptiles occurs. After a fire the vegetation eventually regrows, and the habitat changes from bare ground, through dense mallee and shrub regrowth, to low woodland with many understorey plants and extensive litter. Different species of reptiles with different requirements for food and shelter occupy the habitat one after the other over many years (succession). At the time of the fire many animals escape death by fleeing or moving into burrows, crevices or under logs. Many of these animals may die later from predation or shortage of food, but those that live in burrows would be advantaged over spe-

cies that require litter or plants for shelter. Many years later, when plant cover and litter are extensive, the situation may be reversed.

However, the effect of fire on animals is determined as much by the type of fire as by the species' habitat and feeding requirements. A small fire burning in early spring may burn only the litter and some low shrubs, and leave large patches of habitat unburnt, before going out in the cool of the evening. Such a fire may have only very localised or short-term effects on certain types of animals (e.g. litter dwellers).

By contrast, a fire burning on a hot, windy day in mid-summer may consume all vegetation including leaves in the tree canopies and affect not only ground-dwelling reptiles, but also those that live up trees or under bark (arboreal species such as geckoes). The impact of fauna, and the time required for its recovery to pre-fire levels, would thus be much greater in a large, hot summer fire than a small spring or autumn burn.

How often a particular habitat is burnt is also of great importance to animals; frequent low-intensity fires may have greater long-term impact than a single high-intensity fire. Also, because different animals prefer different stages in the post-fire succession, certain fire frequencies tend to favour one species (or group of species) over another.

Thus, if fire is to be controlled and used for the conservation and management of flora and fauna, long-term research needs to be carried out on its ecological effects. From such research the best size, intensity, timing and frequency of burning to achieve certain aims can be found. For example, it would be

possible to favour a certain species, or to maintain a range of successional stages in order to maximize the number of species in a particular area.

*Ramphotyphlops bituberculatus*: A dark-coloured worm-like burrowing snake, about 30 cm long with smooth shiny scales. When disturbed, these blind snakes often give off an objectionable odour.

*Ctenotus atlas*: A pretty dark brown skink with a long tail and white stripes running the length of its body. Its average length is 18 cm.

*Ctenotus schomburgkii*: This skink is similar to *C. atlas* but slimmer and shorter (about 12cm). Its colour varies with location. In the Eastern Goldfields, it has a black back with pale lines along the sides enclosing a string of pale spots.

*Diplodactylus intermedius*: Commonly called the Eastern spiny-tailed Gecko, it is about 10 cm long and has blotchy grey skin and very long toes.

#### Further reading:

Stanbury, P. (ed.) (1981). "Bushfires - their effect on Australian life and landscape". MacLeay Museum, University of Sydney.

G.M. Storr, L.A. Smith & R.E. Johnstone (1981, 1983). "Lizards of Western Australia, Parts 1 & 11". Western Australian Museum.

Written by Dr Gordon Friend, who is currently researching the effect of fire on fauna in semi-arid nature reserves in Western Australia for the Department of Conservation and Land Management.

*Diplodactylus intermedius*

