RESEARCH

PAST FIRE INTERVALS IN FITZGERALD RIVER NATIONAL PARK

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THE burning question - how frequently should bushland be burnt?

This question was asked for the shrublands of the Fitzgerald River National Park (FRNP) about 10 years ago. The bushland of the south-west survived the climatic fluctuations of the glacial periods of the Quaternary period which covers roughly the last 2 million years, most of it well before Aboriginal Man entered the continent about 50,000 to 60,000 years ago. The fire regime (which covers frequency, scale, seasonal timing and intensity of firing) before Aboriginals were present could be called the 'natural fire regime'.

After Aboriginals entered the south-west the fire regime in the areas they habitually used changed to a composite of Aboriginal-set and lightening induced fires. The greater use they made of an area, the more the Aboriginal fire regime of many smaller fires at frequent intervals (2-10 years) dominated. Conversely, the less use made of an area, the more the natural lightening induced fire regime continued. Semi-arid FRNP was identified from historical documents as an area little used by Aboriginals as it had virtually no permanent fresh water. The first European visitors such as Eyre and Roe in the 1840s found the shrublands extremely thick and difficult to penetrate and all the normal signs of Aboriginal presence found in adjacent areas were missing.

How do we find out how frequent fires were in the past? One way it can be done is by documenting how long after a fire seeder species (plants killed by fire) take to mature, set seed and build up a seed bank that will survive the next fire. The inference is that if the seeder species exist in an area, the fire frequency must have been such that the time to build up a seed bank was shorter than the fire frequency. If a species takes 12-15 years to set it's first seed and 20 years to build up a seed bank, most fires must have been more than 20 years apart. Similarly with the mammal and bird fauna, if the species that live in an area require long unburnt bush areas (say unburnt for 50 years or more), some areas at least must have provided this habitat.

Another method to estimate fire frequency is to examine the charcoal content of a dated sediment core. If sediments suitable to preserve charcoal can be found, and deposition appears continuous, by examining successive layers a picture of charcoal deposition should reflect charcoal production by fire in the surrounding area. If fires are seldom, of large extent, and intense, a large amount of charcoal will be produced at one time. Some of this charcoal will be washed from the burnt area by the next heavy rain and be incorporated in the upper sediment layer. If subsequently no fires occur for a long time, the charcoal included in successive layers of sediment will decrease markedly. A graph of this pattern will show high charcoal peaks followed by a reduction over a long period to low charcoal levels.

What were the results for the FRNP? Recovery of a number of species in marked plots after a fire in 1989 shows that nearly 10% are seeder species that require considerable time to build up a seed bank and suggest fires should be at least 20 years apart, preferably longer. A well-known example of a slow maturing seeder species is Baxter's Banksia. A number of rare bird and mammal species occur in FRNP and most need vegetation for feeding and breeding that has not been burnt for at least 10-20 years, with optimal conditions 20-50 years or more. Such species include the Bristle-bird, Whip-bird, Ground Parrot and Malleefowl, and the mammals Tammar, Woylie, Dibbler, Heath Rat and Honey Possum.

The pattern of charcoal deposition in an estuarine core from Gordon Inlet indicated over the period about 4,600 to 2,700 years before present, that initially fires were infrequent with periods between major fires over 100 years. The charcoal pattern later in the period was more even, but still with major fires not closer than 30 years apart.

The different methods of inferring fire intervals thus agree that fires in this area were not in the range of 5-10 years apart but were considerably longer, probably in the region of 20-50 years apart, with some areas on a considerably longer rotation. The results apply to the area of FRNP and may be considered close to the natural fire frequency of this area of southern shrubland. Similar extended fire frequencies are found on off-shore islands which were not inhabited or visited by Aboriginals. The occurrence of rare plant, bird and mammal species in FRNP suggests that fire frequencies of 2-10 years elsewhere in the south-west may have wiped out many species of both plant and animal life that existed before Aboriginal occupation of Australia.

The results from this study provide basic information on which to base a fire policy for FRNP that will ensure survival of its many spectacular and rare species.

Mt Barren, Dempster Inlet.

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