

FAUNA

WHY DID THE MEGAFUNA BECOME EXTINCT?

In the Pleistocene, about half a million years ago, Australia had a much richer fauna than it has today. Particularly, it had a number of very large animals, collectively called the megafauna – giant wombats, possums, kangaroos, snakes, goannas, flightless birds - none of which were here when Europeans arrived. Why did they become extinct?

There are two general theories to account for this extinction. Firstly that, as Australia drifted northwards, the climate became more arid and the larger animals couldn't cope. The second theory links Aboriginal occupation with changes in fire regime and so vegetation structure, making conditions no longer suitable for the megafauna. A recent paper* has shown that a very wide range of megafauna were living in an arid climate, so the first theory cannot be correct.

A magnificent deposit of fossils was found by cavers exploring under the Nullarbor in 2002, and have been dated to between 400,000-200,000 years ago. Fortunately

the cavers realized what they had discovered, and immediately called in Museum paleontologists. A lot of publicity was given to the first complete skeleton ever found of *Thylacoleo*, the Marsupial Lion, but lots of other animals died after falling through a hole in a cave roof. So far, 69 vertebrate species have been identified in this set of caves, including 23 kangaroo species, eight of which are undescribed. Most of the animals are mixed feeders and grazers, and their very diversity suggests a much wider variety of vegetation than occurs in the area now, including a higher proportion of plants with palatable leaves and fleshy fruits. In addition, two of the new species are tree-kangaroos (whose modern relatives inhabit rainforests) and there are also parrots, implying trees with nesting hollows, close by.

But what was the climate like, was it wetter? Several complex analyses say no, the climate was very similar to today, with an annual mean rainfall of about 200mm falling in a non-seasonal, but slightly winter-

biased, pattern. Thus these animals were adapted to survive in an arid climate. Increasing aridity was not responsible for their extinction.

What was responsible, then? The authors suggest that: "... increased wildfires in the Nullarbor region best explain the conversion of a floristically diverse plant community into the modern, fire-resistant, chenopod shrub steppe." They continue: "Our data do not directly explain the timing of extinctions, but it is significant that the general extinction pattern (the loss of most larger herbivores and *Thylacoleo*) is identical to that witnessed in all southern Australian climatic zones. Most southern species of megafauna were evidently extinct by or soon after 40,000 years ago, at about the time humans reached the south-central coast."

So, human-caused fires changed the vegetation, and so the resource base for the fauna.

Penny Hussey

* An arid-adapted middle Pleistocene vertebrate fauna from south-central Australia. Pridoux et al. 2007. Nature 445: 422-425.

Bush Detective



Here are two pieces of *Hakea varia*, each with a fruit. Or are they? Look carefully. The one on the left is **squishy!**

It is a very clever piece of mimicry by the caterpillar of the grevillea looper moth (*Oenochroma vinaria*). Presumably it adopts this posture as camouflage to fool predators.

The caterpillars are smooth, with two dorsal 'horns' and taper slightly

towards the head. They move with a looping action, feed on grevilleas and hakeas, and can totally defoliate the bush.

The moths have a wing span of up to 5 cm and are usually rosy-purple on top with a purplish spot on the underside of the forewing. They are found from the Atherton Tableland right around the south of Australia to WA.

Thank you to Wayne Gill for this puzzle.