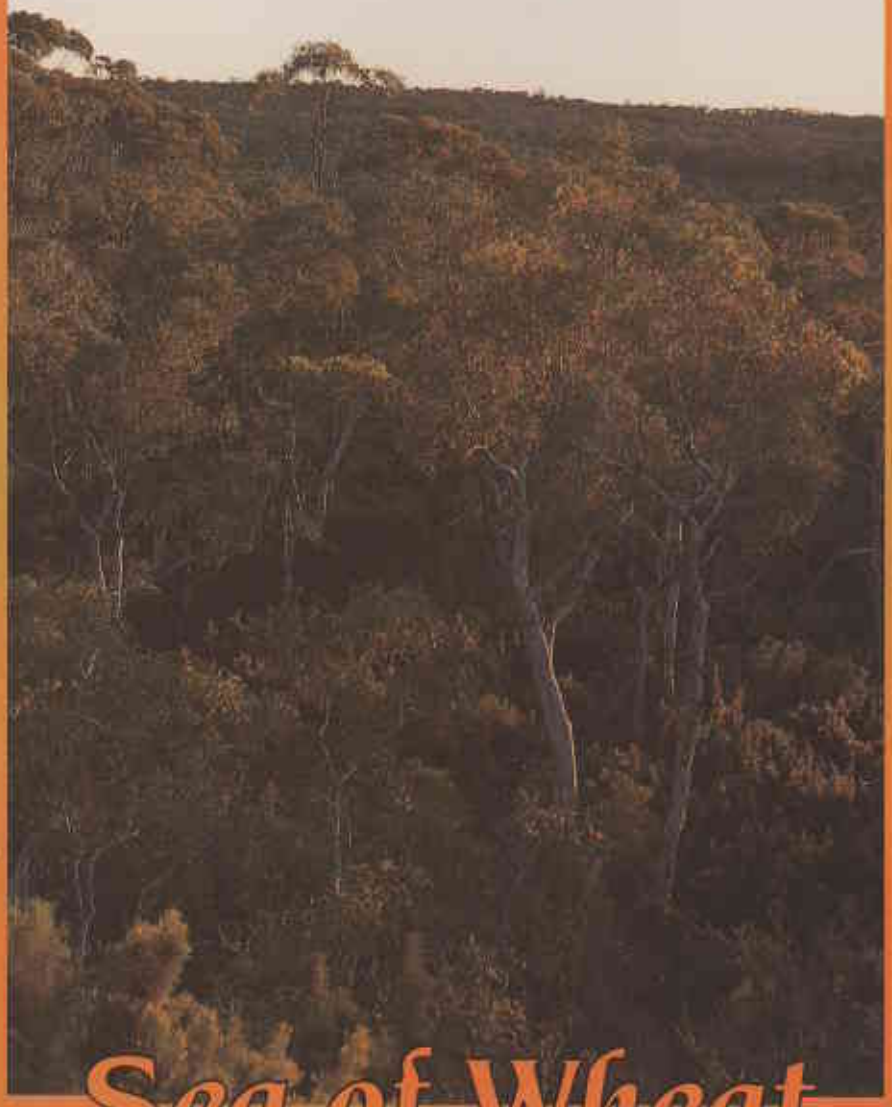
Island of Bush



Sea of Wheat

by **GORDON FRIEND**

TUTANNING Nature Reserve has been acclaimed as one of the richest and most important conservation areas in Western Australia. The 2140 hectare reserve is an important haven for several of the State's rarest mammals, and boasts some of the richest flora sites in the world.

For a place so devoted to preserving flora and fauna, Tutanning lies in an area surprisingly devoid of undisturbed bush. Some 20 kilometres east of Pingelly in the central Wheatbelt, the reserve encompasses the Dutarning Range (after which it is named, but with different spelling) lying between the Avon and Hotham Rivers. This region was first settled in the late 1840s around the area now known as Mourambine, as people followed the rivers east and south from Beverley and York. The Dutarning Range was named by John Forrest in 1869, and the township of Pingelly had its genesis some 15 years later around a freshwater spring on the route of the Great Southern Railway.

Tutanning is an outstanding remnant of the original ecosystem. It harbours some 35 species of reptiles, seven species of frogs and 10 species of native mammals. The reserve is an important haven for several of the State's rarest mammals, including the woylie (*Bettongia penicillata*), the tammar (*Macropus eugenii*) and the red-tailed wambenger (*Phascogale calura*), and is a refuge for the rare malleefowl (*Leipoa ocellata*).

It is also extremely rich in plant life. Over 620 species are recorded to date, several of them rare or of restricted distribution (*Caladenia integra, Stylidium expeditionis, Hakea loranthifolia, Dryandra proteoides* and *Pomaderris bilocularis*). The areas of heathland (kwongan) are the smallest but the richest, recent studies having recorded 315 plant species from 11 sites totalling only 64 hectares. Thus, more than half of the plant species recorded on the reserve come from only about three per cent of its area. Such sites are amongst the most floristically rich in the world.

Hakea gilbertii is one of many flowering plants found on the Reserve.
Photo - Cliff Winfield ▲

Tutanning Nature Reserve contains one of the few remaining populations of the woylie. This small creature feeds on fungi, which it digs from the ground.
Photo - Gordon Friend ▼

A FORBIDDING LAND

Although it was no doubt well known and frequented by Aborigines, the area did not at first welcome Europeans. Early settlers had a tough time eking out an existence in the harsh landscape, most living in shacks and gathering sandalwood or stripping mallet bark for a meagre

income, and keeping a few pigs to supplement their monotonous diet. To these pioneers the rich and abundant fauna was more a source of food and problems than a fragile resource to be protected. In his hand-written reminiscences, settler H. Potts describes the toil of stripping mallet bark near Pingelly in 1905, and how the "boody rats" (the burrowing bettong, *Bettongia lesueur*, now extinct on mainland Australia) would annoy the men all night licking the tins and coming into the tent to eat potatoes and flour, and jumping on their beds.

In these early times fences were uncommon, and the settlers' animals roamed freely through the uncleared bush. Many met an untimely end after eating poison bushes (*Gastrolobium* spp.), which contain fluoracetate compounds deadly to introduced sheep, cattle and horses. This problem, together with the difficulty of clearing the tough bush, and the lack of financial incentives, meant that the pace of settlement was slow during the early 1900s. Gradually, however, farming methods improved and the region became recognised for its agricultural potential. More settlers arrived, particularly in the post-war years of the 1920s and 1950s, when soldier settlement schemes and high wheat and wool prices stimulated rapid development. Vast bushlands were opened up for farming, and heavy machinery soon cleared the diverse native woodlands and heathlands.

Brown mallet grows beneath breakaways in fairly rocky country. The tree's bark is rich in tannins and, during the early years of settlement, mallet bark was harvested for tanning.
Photo - Jiri Lochman ◀

The black-headed monitor (*Varanus tristus*) is fairly uncommon on the reserve. It is semi-arboreal.
Photo - David Mitchell ▼

By the late 1950s only scattered and often small remnants of the original bush remained. Many of these remnants were unsuitable for agriculture, while others were set aside as reserves for mallet (*Eucalyptus astringens*), or supported dense stands of poison bush. This was the case in the Dutarning Range area, where poison bush was very common and several mallet reserves existed. In about 1958, however, much of the area was thrown open for selection. Applications were immediately forthcoming from adjacent landholders.

PIONEERS IN CONSERVATION

It quickly became clear that, without precautions, little would remain of the rich, varied beauty of Tutanning's bush and wildlife. Mr J.P. Marshall, a farmer who owned land south of the Dutarning Range, and Professor A.R. Main and Mr R.D. Royce, of the Fauna Protection Advisory Committee, urged that the land be assessed as a potential fauna reserve. This request, unusual at the time, succeeded on 28 January 1960: Tutanning, referred to then as the East Pingelly Nature Reserve, was vested in the Fauna Protection Advisory Committee for the purpose of "Protection of Fauna". The concept of a conservation reserve had crystallised.

Further history was made on the hot afternoon of Friday 6 November 1964. About 80 people gathered for the official opening of WA's first biological research station and living quarters at Tutanning, realising a pioneering ambition embodied in the original concept of the reserve. What made the occasion even more notable is the fact that some private property had been exchanged for a parcel of State land and added to the reserve for the station site.

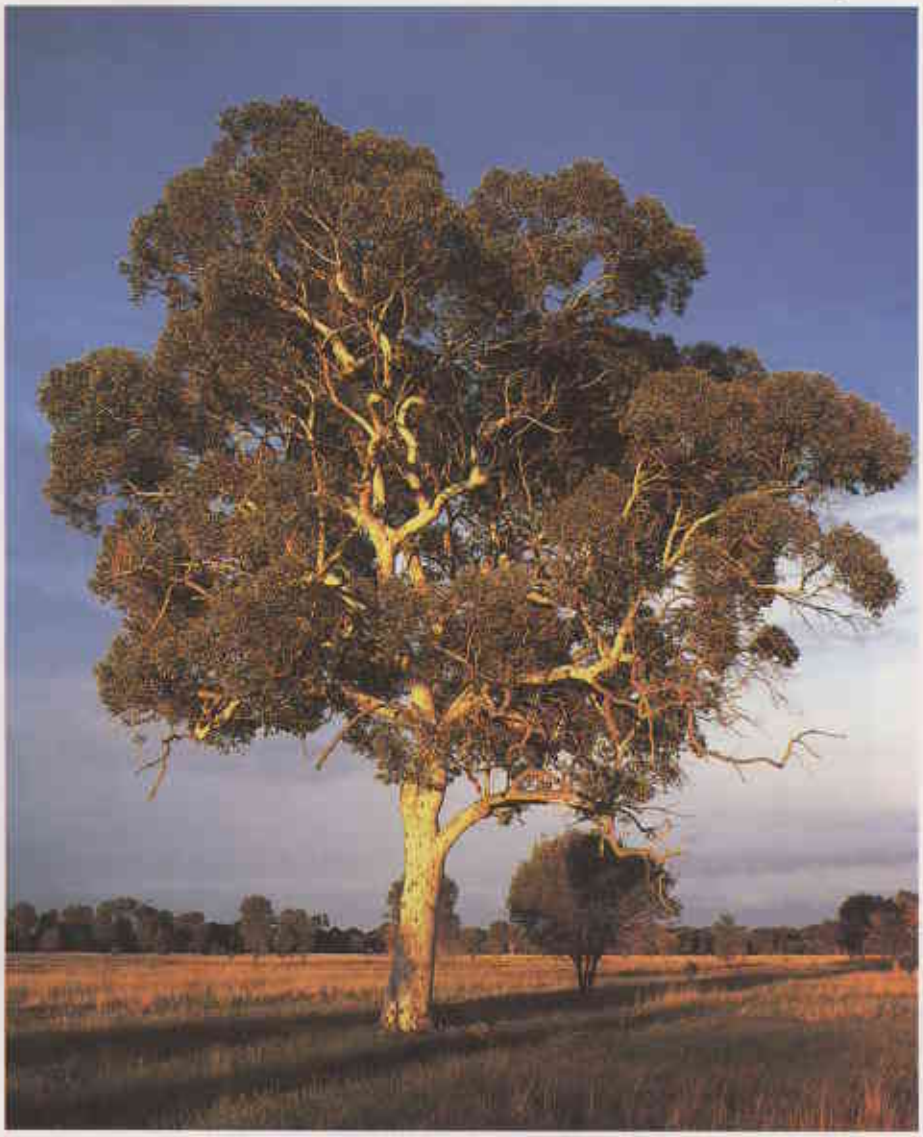
COMMUNITY ACCEPTANCE

The reserve was a "guinea pig" in terms of land acquisition, both for conservation and for research into the management of remnant vegetation throughout the Wheatbelt. There was considerable scepticism within the community about such areas, which were regarded by some as little more than a refuge for weeds and vermin and a fire hazard. Crops adjacent to the reserve were damaged by grazing kangaroos, and the maintenance of boundary fences to control these animals was deemed the farmer's responsibility. There followed a long, and often spirited, dialogue between landholders and reserve staff. Local government members were heard to say that the district needed many things, but Tutanning was certainly not one of them!

Scientists, however, quickly recognised the potential of the reserve for field-based research. It had an outstanding but unstudied flora and fauna, and accommodation and laboratory facilities were all laid on. The reserve became a much sought-after area by both local and overseas workers. Research projects carried out on Tutanning covered a broad range of topics, including flora and fauna colonisation in freshwater ponds on granite outcrops, germination inhibitors in plants, population ecology of woylies, possums and lizards, and eco-physiology and population studies of plants.

Over time, as the local people saw that the reserve was being used and not neglected, they began to accept its value and the need for conservation in general. Community field days became regular events, and a management committee of local farmers and residents was set up.

This change in attitude culminated in the reserve being reclassified as "Class A" in late 1970 (it now requires the approval of both Houses of Parliament to change the classification of the reserve), and it was vested in the Western Australian Wildlife Authority for the purpose of "Conservation of Flora and Fauna". By the late 1970s further additions of land had increased the size of Tutanning to its current 2140 hectares.



Some land that was cleared and farmed has been added to the reserve. Regeneration experiments are under way to restore the area to bushland.
Photo - Gordon Friend ▲

WILDLIFE UNDER THREAT

One of the main reasons for securing Tutanning as a conservation reserve was its rich variety of animals and plants. This was particularly so with mammals. In 1906 G.C. Shortridge camped at Woyerling Spring, five kilometres east of the present reserve, and collected specimens for the British Museum of Natural History. In March that year he wrote to his colleague Mr Oldfield Thomas and reported that an amazing tally of mammals, some 270 specimens, had been collected! This collection comprised many species that are now either very rare or extinct on the mainland (e.g. crescent nailtail wallaby, banded hare-wallaby, burrowing bettong and bilby) or have considerably reduced distributions (e.g. numbat, chuditch and Mitchell's hopping mouse).

Shortridge was so impressed with the mammal fauna that he stayed in the district for about six months, and stated in a later letter to Thomas (May 1906) that he had collected more mammal specimens there than in all the other places of his trip put together.

At this time the Pingelly District probably supported about 26 species of native mammals, and introduced species such as rabbits and foxes had not then gained a strong foothold. By the time the Tutanning Reserve was proclaimed in 1960, clearing and burning for agricultural

CALM undertakes low-intensity burns in the buffers around some Wheatbelt nature reserves to protect them from wildfires.
Photo - Gordon Friend ▲

development, combined with the impact of the now common introduced species, had eliminated about 10 of these native mammal species. The equivalent figure for plant species will never be known, as no systematic collecting was undertaken before clearing.

Although numbats, chuditch, woylies and tammars were still occasionally seen on Tutanning in the early 1960s, it was clear to researchers like Professor Bert Main that urgent ecological management was required if these species were to survive on what was now essentially an island of bush in a vast sea of wheat. This could only be achieved through a program of detailed research on the species' life histories, habitat requirements and the impact of management practices like prescribed burning.

ECOLOGICAL STUDIES

Professor Main and other researchers set about examining the habitat requirements and ecology of key animal and plant species like the woylie, the tammar and sheoaks (*Allocasuarina huegeliana*). This work provided considerable insight into the role of fire and animal-plant interactions in the functioning of such ecosystems.

Fire is a particularly contentious and difficult management issue in small, isolated nature reserves. On the one hand, managers must try to protect lives, property and conservation values from wildfires. Fire regenerates vegetation and provides cover and food for many key animal species like woylies and tammars, whose decline can reduce grazing pressure on sheoaks and lead to profound changes in the ecosystem. On the other hand, prescribed block burning on such small reserves, while favouring herbivorous species, can lead to overgrazing of the new vegetation by the larger western grey kangaroos (*Macropus fuliginosus*), which prefer to eat in open areas.

These issues had to be addressed if Tutanning was to sustain viable populations of Wheatbelt flora and fauna. A program of active management was necessary, backed up by experimental research and long-term monitoring. Such management began in the early 1970s with a series of random prescribed burns in small blocks over a five-year period. In the early 1980s intensive research began on the effects of such burning on the vegetation. Since 1986, pioneering work has started on the fire ecology of small vertebrates and invertebrates on remnant patches of vegetation. Much of this research focuses on the areas of species-rich kwongan vegetation, and is showing that this vegetation type also supports a great variety of small animal life. Revegetation experiments on cleared sections within the Reserve have also begun, and a new and exciting phase of experimental management is now developing.

THE FUTURE

Sadly, the decline of animal (and probably plant) species, typical of small isolated remnants of bush, has not yet been halted at Tutanning. In the last decade numbats, quendas and western ringtail possums seem to have disappeared from the Reserve, and it now contains only about 40 per cent of the mammal species that were present when Shortridge collected in the district.

There is, however, new hope. Researchers have recently found evidence of the positive effects of fox control on native animal populations (see *Landscope*, Summer 1988-89); and, thanks to separate studies, reintroducing fauna to depleted areas is now a real possibility. Furthermore, experimental studies of fire effects and fire management are now getting under way in the far South-West and inland arid areas, as well as the Wheatbelt.

All of this means that the fauna is getting a second chance. Tutanning will figure prominently in this new experimental phase of research and management, and continue as a pioneer ecological research facility and a unique conservation reserve. It is a fitting tribute to those who had the vision to set it aside for conservation so many years ago. ▣

CALM Senior Research Scientist Gordon Friend is studying the effect of fire on small animals in the Wheatbelt and South Coast regions. He is based at CALM's Wildlife Research Centre (phone (09) 405 5100).

Rock-wallabies threw down the gauntlet to scientists trying to trap them for research. Who ended up winning the catch-me-if-you-can contest?
See page 35.

Shells, tiny crabs and sundry other creatures are sure to please the curious naturalist who invades the intertidal zone at low tide. Explore the place where the shore meets the sea on page 23.

Waterbirds flock to the Vasse-Wonnerup wetlands in their tens of thousands, some travelling over 10 000 kilometres from summer breedings grounds in northern China and Siberia. Turn to page 17.

LANDSCOPE

VOLUME FIVE NO 3 AUTUMN EDITION 1990

Scientists will use modern technology to restore two rare and endangered mammals to an area in the Gibson Desert from which they have become extinct.
See page 10.

It's the burning question! Is prescribed burning in spring or autumn better for the jarrah forest? Or is there another alternative?
See page 28.

FEATURES

REGULARS

COVER

The designs of desert artist Benny Tjapaltjarri show events associated with the Pakuru or golden bandicoot dreaming in the Gibson Desert. The three central roundels depict rockholes and the others represent hills. The background dots show the vegetation of the area.

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