

# Bringing up Young Numbats

by J.A. Friend and R.G. Burrows



▲ Young numbats playing. Photo copyright A.G. Wells.

The numbat (*Myrmecobius fasciatus*), a small strikingly coloured marsupial of Western Australia's southwest, and the State's official mammal emblem, has been the subject of increasing concern over the past five years because of a steep decline in the numbers of its population in the wild. Accordingly, in early 1981, the Department of Fisheries and Wildlife initiated a comprehensive research programme into the ecology of the species which, it is hoped, will lead to sound management practices to ensure the continued existence of the animal in the wild.

A population of numbats at Dryandra, an area of State Forest near Narrogin, became the focus of this investigation as sufficient numbats still existed in this area to make the study feasible.

Since January 1982, the activities of a number of numbats at Dryandra have been monitored by radio-tracking. While this technique can yield a large amount of data on the movements of individuals, it is probably of greater value in allowing animals, especially rare or secretive species, to be easily located and observed in their natural habitat. Being active only during daylight numbats are especially suited to this form of investigation. We have used both aspects of radio-tracking to learn new facts about the production and care of their young by numbats in the wild.

▼ Numbats often stand on their hind legs to survey for possible danger. This one, Jill, is wearing a radio transmitter. Photo A. Friend.



Most of the information related here was collected by radio-tracking and observing adult numbats and their young in one particular valley in Dryandra Forest (see map). In addition, other individuals have been tracked during the year in other parts of the forest. As a result of this work it has been possible for the first time to put together a picture of the sub-adult life of the numbat and to partially elucidate the social organization of a population.

The vegetation in this valley is typical of the area, which is characterised by lateritic uplands separated by broad valleys. Annual rainfall here is about 500mm, of which 85% falls between April and October. The valley floors bear an open formation dominated by wandoo (*Eucalyptus wandoo*) with very little understorey. As the slope increases at the valley sides, the wandoo trees stand closer together and there is often a dense understorey of sandplain poison (*Gastrolobium microcarpum*). The high density of trees on this "wandoo slope" is accompanied by an abundance of hollow logs on the ground, as



- Wandoo Woodland
- Limits of movement during radio-tracking periods by numbats Jeremy (area 1, 12 full days between July and October 1982) and Jill (area 2, 45 full days between March 1982 and February 1983).
- - - Limits of movement by numbats Jeremy (area 1) and Jill (area 2) between 30th August and 10th September 1982.
- Nursery areas in which young numbats moved during the day from their nursery log or burrow. Nurseries in areas 1, 2 and 3 were used by three different litters of numbats. The family in area 3 was tracked for short periods only.
- Nursery log
- ▲ Nursery burrow

NOTE: Contour interval 10m

0 200 400 600 800m

wandoos often drop branches which have been hollowed out by termites. Further upslope, the wandoo is replaced rather suddenly by powder-bark (*E. accedens*) and the shrub layer becomes more diverse and less dense, sometimes disappearing altogether. Here the ground is covered by a relatively thick litter layer, and hollow logs are less plentiful than is usual on the wandoo slope, although the density of trees is higher. The tops of the ridges are often capped with laterite and support a diverse and varying assemblage of plants dominated by powder-bark on jarrah (*E. marginata*) depending on the situation. If the change of slope at the edge of the plateau is abrupt, forming low cliffs ("breakaways"), stands of brown mallet (*E. astringens*) often occur on the downslope side.

The first numbat radio-tracked in this valley was Jack, a male caught in area 2 (see map) during January 1982 and followed for a week before his signal disappeared, probably through transmitter failure. However, in March 1982, a female, which we presumptuously called Jill, was caught in the same area, fitted with a transmitter, and released. Four young, at this stage about 2-3cm long, were found attached to her teats. We were able to monitor the development of the young, from this early stage, right through to independence and dispersal, and to follow the changing behaviour of the mother during this period.

In March and early April, Jill's daily activity started between 8am and 9am when she left the hollow log

where she had spent the night, and moved off on her perambulations. Numbats spend much of their active time seeking out and feeding on termites, which they are specialised to eat. During the day Jill would visit a number of logs, often spending several hours of the early afternoon in a log before another period of activity. At this time of year she generally entered the log in which she was to spend the night, between 5pm and 6.30pm.

A similar daily routine was followed by another female carrying young which we tracked at the same time in another part of the forest.

The daily routine of the wandoo numbats was much the same as that described in *Forest Focus* no.27

reporting radio-tracking by Forests Department research staff of individual numbats in jarrah forest in the Perup area near Manjimup.

When winter came on both Jill and a male numbat, Jeremy, which we caught in area 1 (see map) in July, were only outside their night refuges between about 10am and 4.30pm, thus spending a stretch of at least 17 hours inactive overnight. There was a lesser tendency for Jill to enter logs during the day than during March, although the male differed in this respect and visited logs regularly all day. Presumably his nutritional demands were smaller than those of a female with a litter of young to feed.

All numbats tracked at Dryandra have, after 2-3 days, settled down to spend most of their nights in one or two "favourite logs". Jill was no exception and while we tracked her in July, she slept almost every night in a particular log in the wandoo slope. By this stage her young were becoming rather large, having grown from 2.3cm long on 26th March to 5.5cm on 16th July. While in March they had been pink and hairless, now they were dark grey, pug nosed and covered with velvet fur and bore 6-8 distinct stripes across their rumps.

On the 11th August we recaptured Jill and discovered that her young were no longer attached. After being released, she led us to the place where she had deposited them, a newly dug burrow beneath a small fallen branch on the wandoo/powder-bark boundary in her area. Most numbats followed have visited burrows from time to time, sometimes spending the night in one. Jill had at least three others which she had visited while being tracked, but this one had not been detected before.

Despite the fact that she was no longer carrying her young with her, Jill's daily routine was not appreciably changed. She emerged at about 10am, spent the day away from the burrow feeding, travelling around her area, and sometimes resting in logs, not returning to her young until about 5pm, when she would enter the burrow and stay there until morning. This seemingly heartless behaviour is most probably to avoid drawing the attention of predators any more than possible to the burrow, to which she must return each night.

On 1st September, another female numbat was caught, on the other side of the forest. This female, named Babs, was obviously suckling young, we fitted her with a collar and tracked her to a burrow. Each morning for a week, wildlife photographer Bert Wells watched carefully from a distance while Babs left the burrow and soon after, her four young, each about 10cm, from the nose to the base of the tail, emerged one by one from the burrow, spending up to three hours active in and out of, and

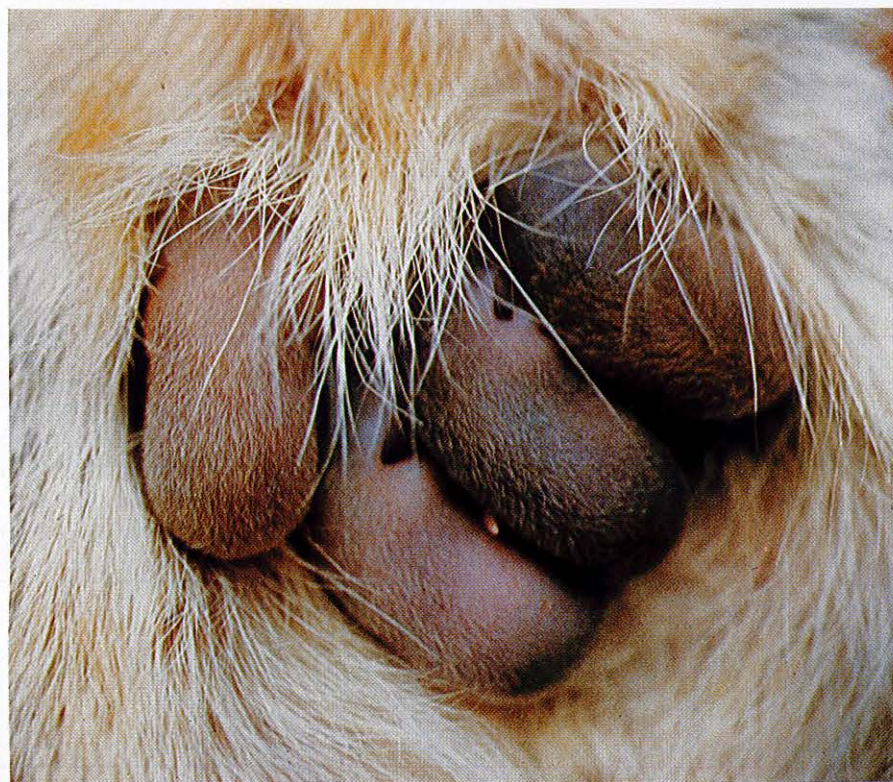
around the burrow. At this early stage of their movement from the nursery in the first week of September the young numbats appeared not to be feeding, but occasionally turned over small stones and twigs, as well as making short trips into the surrounding bush and investigating nearby hollows. Bert watched them basking in the sun, stretching out full length like cats, urinating, sometimes lying prostrate on the ground or standing up on their haunches. Occasionally one would

▼ The adult numbat at the top is the mother of three of the young. At the bottom is a younger male from a different female's litter. Photo A. Friend.





▲ On the 26th March, 1982 these young numbats were almost hairless and only about 2.3cm long. Photo A. Friend.



◀ By 2nd June, the young are about 4cm long and their stripes are just visible. Photo A. Friend.



▲ Their eyes are still tightly closed but the young can move from one teat to another by the 16th July. Photo A. Friend.

Jill had still about one month to carry her growing young with her when this photograph was taken on 1st July. Photo A. Friend. ▶

▼ The young numbats' ears and tails are furred by 16th July and nails have developed on their hind feet. Photo A. Friend.



yawn in true numbat style, with the long tongue fully protruded and then pulled back in after the mouth was closed. At any sign or sound of danger, especially by a bird overhead, the juveniles would shoot back down the burrow immediately, emerging again after varying periods of time. They were occasionally seen to look upwards as if scanning the sky for enemies. It is fairly obvious that a bird of prey poses probably the greatest threat amongst the natural predators of the numbat, being able to attack swiftly and silently after picking up the movement on the forest floor.

Meanwhile, Jill had moved her young from the first burrow to another burrow 300 metres away, which she had visited previously. This occurred on the 10th September, over four weeks since she had left them in the first place. We missed this event but were lucky enough to be watching the new burrow two days later, when, after spending an hour feeding in the morning, Jill returned to the burrow and then re-emerged, followed by three young numbats. Two of them climbed onto her back, the other shot back down the burrow and Jill started to make her way away from the area. The young clung on to her back, apparently gripping her fur in their mouths, with their tails curled tightly beneath her body. One or both of the young would fall off from time to time and she would sometimes stop and allow them to climb back up, but if not the juveniles would run along behind until they caught up. That night the first two young stayed with their mother in the log in which she had spent most nights before moving to the burrow. Just before dark, however, Jill ran to the second burrow and then back to the log, as if checking that the other two were still safe. They were left there all the next day, however, until the late afternoon, when Jill picked them up and again made the laborious 200 metre journey to the log. Once there, she made two trips to the log's entrance a metre off the ground, carrying one young numbat at a time. On each occasion, she stood outside the opening for 30-40 seconds before the juvenile on her back would get off and enter the log.

Jill and her four young were based at this log from the 6th September until about the 2nd October. During



▲ This young numbat is climbing down from the hollow where he and his last surviving litter-mate spend each night, sometimes joined by their mother. Photo A. Friend.

this time Jill was returning every night to the log, while during the day the young numbats stayed longer and longer outside. At first, only one would come out, sun himself for half an hour or so on the log, then return inside. The behaviour of this litter developed in a similar way to that of Babs' young. By the end of the month all four were spending long periods away from the log.

Early in October, the family left the log. At the same time, Jill's

transmitter failed, and we lost contact with them for about three weeks. However, during this time, one of the male young disappeared, and a fox scat found on the log soon after they left it may provide a clue to his fate.

On the 20th October, while checking Jeremy's most-used log in Area 1 (see map) we noticed three young numbats inside it. From this log next day we trapped three juveniles, and an adult female, which we called Fiona. We were able to fit

all four with transmitters, the juveniles with special collars, which would fall off before the animal's neck grew sufficiently to choke it. There were regularly replaced and enlarged. All our radio-locations for Fiona were inside or just outside Jeremy's territory, and as the family was found in his log, it is fairly safe to assume that Fiona was Jeremy's mate. Subsequently also, Jeremy was found in a burrow with one of the young.

Our work in this valley has indicated that numbats live in family groups for at least part of the year. It appears that each of these groups occupies a home range which does not overlap with those of adjacent family groups. As well as the families of Jill and of Jeremy and Fiona, we caught two other juveniles and sighted a third, as well as catching an adult male and female, all of which appeared to be based in area 3 (see map) further down the wandoo valley inhabited by the other two families.

The night following their release, Fiona's young were back in Jeremy's log, but several days later they had all moved across the valley to a burrow under some boulders on a small breakaway (nursery area on map, area 1). Each day the young numbats, which were about 19cm in head-body length and weighed about half of an adult numbat's 550g, left the burrow and spent the day feeding and visiting logs in the nursery area, which was of ever-growing dimensions. It is interesting to note however, that this nursery area grew most significantly into Jeremy's area, but stopped short of Jill's area, which was quite close to the north-east (see map). It seems that the young were aware of where their parents' territory ended, although the adults apparently spent very little time near the young during the day.

It appears that by late October Fiona's young had been weaned off their mother's milk. When we caught her, she was not lactating in any teat, and the mammary area was very swollen, indicating a recent cessation of suckling. By this stage the young were eating termites, and their nursery areas were riddled with diggings, many much larger than those of adults. Young numbats tend to dig for long periods in one spot, as if the digging response is so strong that the act of feeding is irrelevant!

On the 29th September we caught the fourth member of this litter, a female; the litter thus comprised three males and a female (Jill's litter included two males and two females). She was also sharing the burrow and must have escaped when we caught the other three. However, 2 days later we picked up a signal from one of her brothers for the last time. The others all remained in the area for eight days longer, then one evening all signals vanished from the area. After this time we also failed to locate either Jeremy or Fiona, and their logs ceased to be used. It appears that the whole family left the area, although possibly the first young male to disappear was taken by a predator.



▲ Photo copyright A.G. Wells.

The threat posed by birds of prey had become all too clear earlier in September when a collared sparrowhawk or brown goshawk was seen in Jill's area (area 2) flying off slowly clutching a small numbat. When chased, it dropped its quarry, which turned out to be a young numbat, still warm, but with its skull completely missing. Later that day at the same location (small nursery area in area 2) we caught Jill's two remaining young, which were now based at a nearby burrow.

Young numbats are possibly more vulnerable to predation when they start to leave the nursery burrow or log than when they stay close to it. Each day they venture into a little

more unknown territory, with its attendant dangers. The normal toll from natural predators, let alone introduced animals such as the fox or cat, must be very high.

On the 28th October, Jill once more moved the two remaining young, again carrying them on her back to another site about 400 metres away, up in the powder-bark. Most numbats tracked in Dryandra spend the bulk of their time in the wandoo, but some of their territory extends up into the powder-bark. The "log" to which the young were taken was actually a broken tree-trunk about 4 metres high, with a hollow at the top. We have found several numbats using these dead trees as shelters, in contradiction of the generally held view that this species is in no degree arboreal. It is necessary, however, that part or all of the tree is dead: it seems that the numbat's claws cannot grip onto the living bark of the smooth-barked wandoo and powder-bark trees.

When a numbat climbs down the outside of one of these nest-trees, it does so forwards, with its hind feet out sideways, like brakes, tail often held flat against the trunk. In this, it resembles the behaviour of that very arboreal dasyurid, the phascogale or wambenger.

We tracked the last two young until mid-December, when one by one, they disappeared from the area. Their daily movements had been becoming very long, travelling up to 800m from the nest-log before returning to the nursery area at night.

It is very noticeable that the adult numbats are seldom present during the day and that young numbats virtually teach themselves to feed, and explore the surroundings of their nursery. The role of the adult female once the young are weaned, and possibly the adult male, appears to be more in assessing the possible danger to the young and responding to it by choosing a new nursery area, and moving the young to it. It is interesting to note that less than a month after the final movement of Jill's young away from her area, she had another four tiny pink creatures attached to her teats.