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*This publication is designed as
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organisations, individuals, and
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personnel may be kept
informed of the work being
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of departmental policies and
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a better understanding and
appreciation of Western
Australian wildlife and the
role it plays in maintaining a
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**Editor:
Malcolm Taylor
B.Sc.(Hons.) Dip. M.S.
Assistant Editor
Kevin Carhart**

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COVER PHOTO

The only crested penguin recorded in Western Australia, the Rockhopper Penguin (*Eudyptes chrysocome*) is more usually found in circumpolar regions where it breeds on islands such as Macquarie and New Amsterdam. These penguins are occasionally seen on Western Australia's south-west coast between January and February and are usually in a state of moult. In 1983, three Rockhopper Penguins were recorded between Busselton and Augusta, and a further two in 1982. Photo P. Lambert.

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.

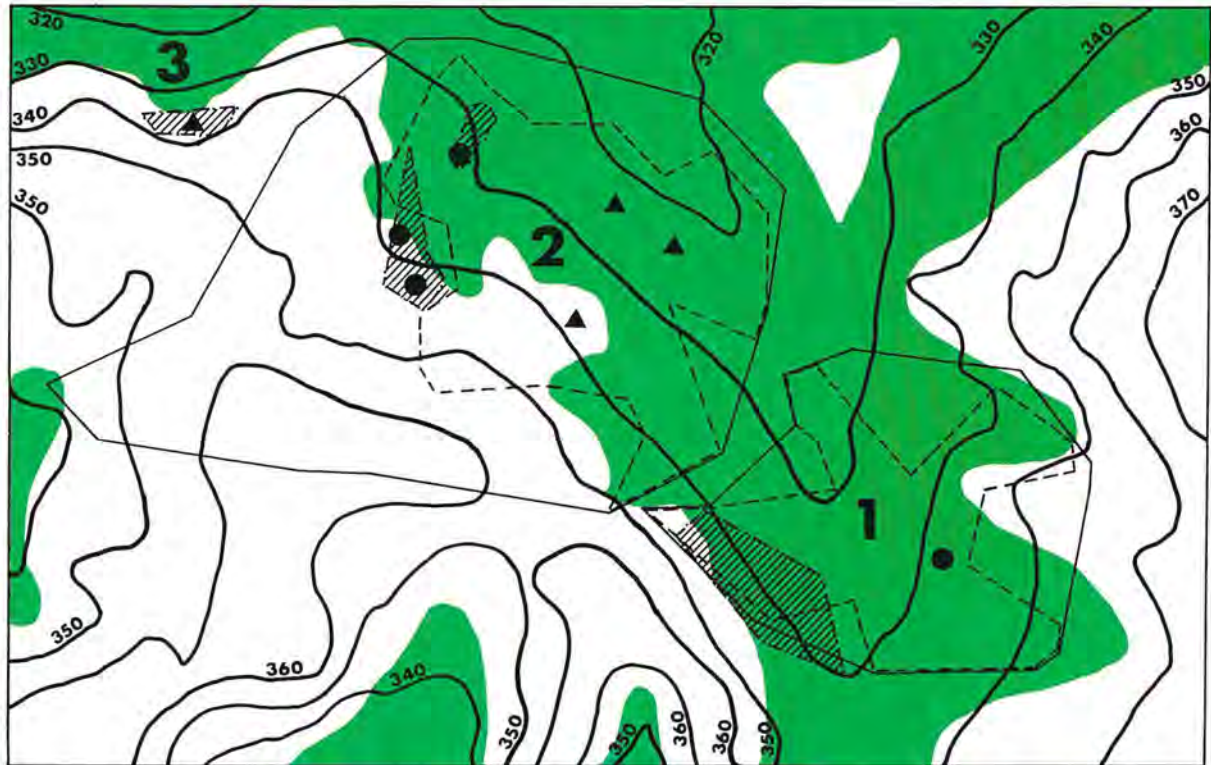
Since January 1982, the activities of a number of numbats at Dryandra have been monitored by radio-tracking. While this technique can yield a large amount of data on the movements of individuals, it is probably of greater value in allowing animals, especially rare or secretive species, to be easily located 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 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.

New Wildflowers from the Wongan Hills Wildlife District

by Dr S. Hopper, Research Officer, W.A. Wildlife Research Centre

Fifteen new wildflowers occurring in the Wongan Hills Wildlife District were described in the latest edition of *Nuytsia*, the bulletin of the Western Australian Herbarium (Volume 4, Number 1). This wildlife district occupies an area approximately 250km square in the north-central wheatbelt (see map on the back cover of this issue).

The range of colour and form among these newly described wildflowers is illustrated in the accompanying photographs. They include large and quite beautiful mallees (e.g. *Eucalyptus synandra* and *E.caesia* subspecies *magna*) through to small inconspicuous herbs (e.g. *Conostylis wonganensis*). The naming of these plants, several of which are rare and endangered, is the culmination of years of work by local residents, by members of the Western Australian Naturalists' Club, and by the botanists from Perth, Canberra and Adelaide who have provided the published descriptions. (Text continued page 14)

▼ *Acacia botrydion*
The latin name of this new Wongan Hills wattle means "bunched like grapes" and aptly describes its clustered inflorescences. (Photo S.D. Hopper)



▼ *Eucalyptus synandra*

A straggly mallee up to 6 metres tall known from scattered locations between Morawa and Koorda, and in the southern Great Victoria Desert. Flowers are yellow when the bud cap falls off but change bright pink with age. This species has considerable potential for horticulture. (Photo P. Roberts)





▲ *Daviesia spiralis*

An intricate rounded shrub up to 1.5 metres tall known only from the gravelly uplands of the Wongan Hills. It has remarkably spirally twisted leaves, and has no close relatives in *Daviesia*. It flowers from September to January. (Photo P. Roberts)

▼ *Conostylis wonganensis*

This clumped perennial herb has narrow rounded leaves up to 17cm tall. It is normally inconspicuous but has attractive star-like flowers that appear mainly in August. This is a very rare relative of the kangaroo paws, known from only two locations near Wongan Hills. (Photo P. Roberts.)



Back from the Brink



Dr. Jenny McComb
inspecting *Styliidium
coroniforme* in culture.

Advanced laboratory techniques and the chance find of a new population in the wild has given a new lease of life to one of Western Australia's rarest wildflowers, the Wongan Triggerplant (*Styliidium coroniforme*).

Until a few months ago, it was thought that the plant was close to extinction as only two individual specimens were known to exist in the wild. These two specimens were the subject of an intensive hand cross-pollination attempt by one of the Department's District Wildlife Officers, Phil Roberts, as described in *SWANS* Vol 12 No. 2 1982.

However, since that time, a new population of Wongan Triggerplants consisting of about 1 000 plants, has been discovered on Crown land several kilometres from the known specimens. The new population was discovered by Wildlife Officer Roberts during a routine inspection of the area.

As the new population is on Crown land, whereas the individual specimens were both located on private land, an attempt is now underway to gazette the area as a Nature Reserve. In addition to the rare Triggerplants, the surrounding land is a rich habitat for many interesting and important species of flora and fauna. The vegetation includes tamma/bottlebrush shrubland, wattle thickets and woodlands of York gum, salmon gum



▲ *Stylidium coroniforme* The Wongan Triggerplant, reprieved from extinction. (Photo P. Roberts)

and gimlet. The richness of the vegetation is indicated by the fact that 10 species of eucalypt, 10 of orchid and nine of feather-flower (*Verticordia*) have been recorded in the area. Another rare species, the Wongan Cactus (*Daviesia euphorbioides*) and an undescribed species of *Conostylis* have also been found growing within the proposed reserve.

Although the discovery of the new population of Wongan Triggerplants has multiplied manifold the plant's chances of continuing to exist in the wild, it is far from being out of danger. Accordingly, the latest results from last year's hand pollination attempts by Wildlife Officer Roberts are of considerable interest and importance. The most success has so far been achieved by Dr Jenny McComb of the Environmental and Life Sciences Department, Murdoch University.

Of the 45 seeds given to Dr McComb from last year's pollination programme, three have since germinated. However, more importantly, Dr McComb has had outstanding success in tissue culturing these seedlings and, at this stage, it seems likely that hundreds of new plants may be cloned from them. Some of these may then be able to be transplanted back into the wild at a suitable Nature Reserve thus increasing the species chances of long-term survival.

▼ A nutrient gel is used as a culture medium for laboratory cloning under controlled conditions.





▲ *Microcorys eremophiloides*
 The tubular flowers of this shrub are 4cm long and appear well adapted for bird pollination. *M. eremophiloides* grows erect and openly branched to 2 metres high on massive laterites in the Wongan Hills. Only a few hundred plants are known. (Photo P. Roberts)



▲ *Acacia botrydion*
 This colourful wattle flowers from July to September. It grows as a craggy diffuse shrub to 1.3 metres tall on the laterite soils of the Wongan Hills. (Photo B.R. Maslin)

▼ *Eucalyptus caesia* Benth subspecies *Magna*
 This beautiful mallee from granite rocks north-east of Merredin is a favourite among native plant gardeners. There are far more plants in cultivation than the few hundred known in the wild. The large flowers (up to 6cm across) appear in winter and attract several species of honeyeaters to their nectar. (Photo S.D. Hopper)



(Continued from page 10)

Local residents, particularly Basil and Mary Smith of Manmanning, discovered some of the new species and alerted professional botanists to their existence. A number of the new species are known only from the gravelly Wongan Hills (N.W. of the town of the same name), and were discovered by members of the Western Australian Naturalists' Club during surveys of the hills led by Kevin Kenneally, a botanist with the Western Australian Herbarium. These surveys were part of a programme of work that was published as a handbook in 1977 (K.F. Kenneally, coordinator, "The Natural History of the Wongan Hills", Handbook No.11, W.A. Naturalists' Club, Perth).

Publication of the handbook drew the attention of the Department of Fisheries and Wildlife to the occurrence of a number of rare or poorly known wildflowers in the Wongan Hills. Consequently, Dr Barbara Rye was appointed in 1980 as a botanical consultant to search for these rare plants and report on their conservation status.

As a result of the combined efforts of all these fieldworkers, it became apparent that several of the unnamed wildflowers in the district were very rare indeed and that they deserved the special protection afforded by being "rare flora" under provisions of the Wildlife Conservation Act. However, for administrative reasons, it is necessary that wildflowers be formally named by botanists prior to their gazettal as "rare flora". Their recently published descriptions in *Nuytsia* serve this purpose.

The naming of these new wildflowers also highlights the importance for conservation of areas of uncleared bushland in the wheatbelt. Because the wheatbelt flora contains a remarkably large number of rare and localised plants, the task of locating and naming them is likely to occupy botanists well into the next century. As demonstrated clearly by work in Wongan Hills, setting aside areas of bushland on farms and reserves will give future botanists the opportunity to complete this task. Perhaps future studies elsewhere in the wheatbelt will bring to light wildflowers as beautiful and as suitable for horticultural utilization as those featured in this article.

Conservation of the Dalgyte

Few Australians are familiar with one of the country's most beautiful and graceful native mammals, the Rabbit-eared Bandicoot, otherwise known as the Dalgyte or Bilby. In addition to its prominent, rabbit-like ears, the Dalgyte boasts long silky hair over most of its body and a strikingly marked black and white tail. Despite its distinctive appearance, however, and its canter-like movement, the Dalgyte is mostly unknown to the average Australian as it is now confined to remote and arid desert areas where few travellers venture.

However, the confinement of the Dalgyte to these remote desert areas is relatively recent. Previously, the animal was regarded as quite common in such areas as the wheatbelt of Western Australia and the more arid woodlands of Victoria and New South Wales, areas where they are now completely unknown. The Dalgyte was last reported in Victoria in 1866 and in New South Wales in 1912, and disappeared from the W.A. wheatbelt during the 1930's and 1940's.

▼ The Dalgyte (*Macrotis lagotis*) This specimen is from the Warburton area. (Photo copyright A. G. Wells).

Although considerable work has been carried out on the biology of Dalgytes it has mostly been on captive populations and little is known of the animal's life in the wild. Consequently, it has been difficult to assess its true status and the full reasons for its decline over much of Australia. With this in mind, a joint programme between the Northern Territory Conservation Commission and the Western Australian Wildlife Research Centre to fully investigate the Dalgyte in the wild is about to get underway with the financial assistance of the World Wildlife Fund Australia.

The principal aim of the project is to establish the current distribution and general abundance of the Dalgyte to assess the range of habitats which it occupies, and to try to understand the reasons for its decline. The data so obtained will greatly assist in deciding which existing National Parks and Reserves are suitable for the re-introduction of the species and/or if necessary, which areas might need to be acquired for this purpose.

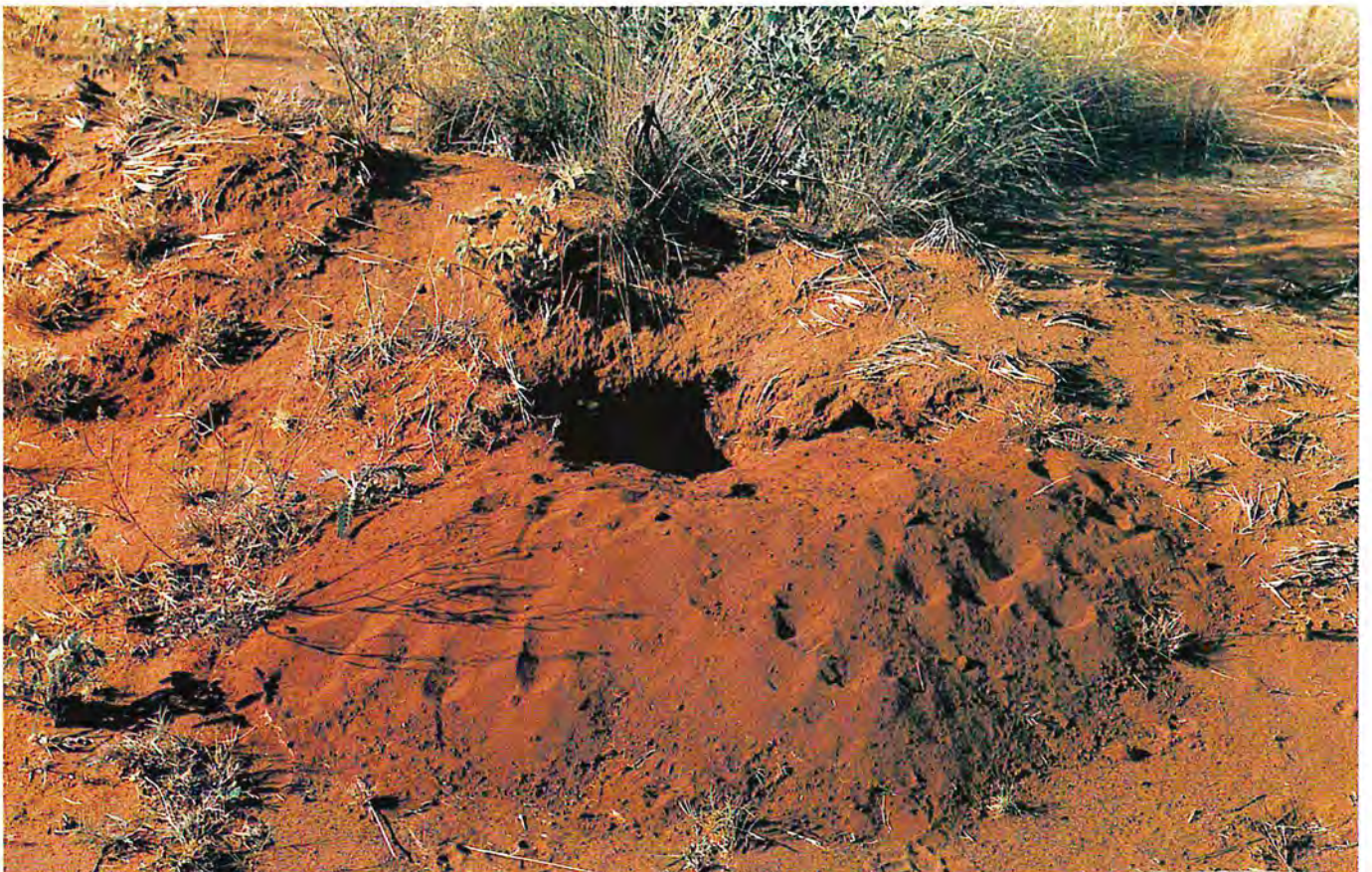
The reasons for the decline of the species are not clear although it is thought probable that competition for food and burrows with rabbits is involved. Destruction of habitat by livestock such as sheep and cattle and predation by introduced cats and foxes may also be important and it is hoped the project will shed further light on this aspect.





▲ Tracks of Dalgyte travelling from left to right.

▼ Dalgyte burrow, Tanami Desert, Northern Territory. (Photo A. A. Burbidge)





▲ Characteristic Dalgyte scat.

▼ Typical Dalgyte diggings made in search of termites.



The project is expected to span at least three years as the remoteness of the present Dalgyte populations and their apparent low densities will make field work both difficult and time consuming.

The Dalgyte has important mythological and totemic status among the Aborigines of Central Australia and the immense decline of the species in recent years has caused a great deal of concern to these people, particularly to the tribal elders. Consequently, initial work will involve liaison with Aboriginal communities around the desert region, and familiarisation of the general habits of the Dalgyte and the conditions necessary for its existence, e.g. food sources, soil conditions needed for constructing burrows, and the vegetation communities normally associated with the presence of the species. Much of this early work will be carried out in the Tanami Desert with the assistance of Wildlife Research personnel from the Conservation Commission of the Northern Territory.

Using the information so gained, survey work will be carried out in other regions outside the Northern Territory, such as around Broome, Warburton and the Blackstone Range area in Western Australia. Here the diet and habitat studies will continue once colonies are located and, where possible, live specimens will be captured for taxonomic study and contribution to a captive population.

Survey work is also hoped to be undertaken in Queensland toward the end of the three year period.

The following information is based on present knowledge of the Dalgyte. Unlike other bandicoots, the Dalgyte always lives in a burrow and is a very accomplished digger. Their burrows generally have only one entrance which is often concealed by spinifex or other low vegetation. In common with other bandicoots, the Dalgyte seems to be a solitary animal and often has several burrows, which it occupies in turn, scattered over its range. The animal is carnivorous and has been reported to eat both meat and insects, with beetle larvae and termites being its principal food. The breeding season appears to be between late summer and early winter and the litter size ranges from one to three young.

Twenty-Eight Parrot (*Barnardius zonarius*)



(Photo copyright G. Chapman)

This brilliantly coloured bird is considered to be Western Australia's commonest and most widespread parrot. It is frequently seen in Perth, particularly in those outer suburbs which adjoin native forest.

The Twenty-eight Parrot takes its name from its well-known call which sounds like that number. However, the familiar call is restricted to the races of the South-West and the North-West and elsewhere the call is a simpler "tweet-tweet".

Although there is considerable colour variation in the species, the form most often seen in Perth and the South-West has all green underparts with a prominent red forehead.

The bird feeds on the pulp of green eucalypt capsules but has also learnt to eat a wide variety of introduced and cultivated plants which occasionally causes it to be a pest.

The Twenty-eight breeds in spring and summer although in northern Australia the parrots are opportunistic and may start nesting as early as May following good rains. The bird nests in tree hollows, laying between four and seven eggs, with five the more common number. They are white and are inclined to be more pointed at one end than is usual with parrots.

Black-faced Cuckoo-Shrike (*Coracina novaehollandiae*)



(Photo copyright G. Chapman)

A frequent visitor to parks and private gardens in Perth, the Black-faced Cuckoo-Shrike is also commonly found in woodland throughout the State. The flight of the bird is characteristically undulating, with alternate flapping and gliding often accompanied by a soft "churring" note. On perching, the bird settles its wings in a curious manner, lifting one wing alternately with the other.

Despite its cuckoo-like flight and its common name, the Black-faced Cuckoo-Shrike is not closely related to either cuckoos or shrikes.

Adult birds pair for breeding during spring and summer and together share the task of building a nest, incubating the eggs and feeding the young. The nest is usually constructed on a horizontal fork of a branch, preferably about 5-6m above the ground. The usual construction of the nest is a shallow saucer made of small sticks and bark held together with spiders' web. The birds are shy and may leave the nest at the slightest interference to build a new nest at another site.

The eggs are blue-green or olive with pale red, brown or grey markings and a clutch usually numbers between two and three eggs.

Black-faced Cuckoo-Shrikes are primarily insect eaters although they have also been known to eat berries and other fruit.

Common Birds of Perth Number 8



Grants aid Flora Surveys in the Wheatbelt and its Margins

by Dr. Stephen Hopper, Research Officer, W.A. Wildlife Research Centre

Grants totalling \$70 000 have been awarded by the Australian Heritage Commission and by the Australian Biological Resources Study to the W.A. Wildlife Research Centre to enlarge the State's programme of flora surveys in the wheatbelt and adjacent areas. These regions contain many rare or poorly known plants found nowhere else in the world and whose conservation status is uncertain.

The grants will be used to engage consultant botanists to search the wheatbelt and adjacent land areas for rare native plants and prepare detailed reports on their work. The reports will provide maps of the roads and tracks traversed and of locations of the rare plant populations found. In addition, they will review the literature on each species surveyed, provide photographs, and give detailed accounts of the associated vegetation, the number of plants counted in each population, the presence of seedlings, pollinators, disease, response to fire, ownership of the land and threats to the plants' conservation.

This information will then allow administrative and field staff of the Department of Fisheries and Wildlife to notify landowners about the rare plants on their properties. Where rare plants are located on Crown land, the survey information will enable steps to be initiated to acquire the land as nature reserves set aside for flora and fauna conservation. Should this not be possible, the authorities in whom the land is vested can at least be notified so that their activities may be planned to minimise accidental destruction of the rare flora.

The survey reports will also provide important baseline information so that future changes in abundance may be monitored. Such baseline data are essential for management planning.

◀ *Banksia cuneata*
Quairading *Banksia*, is one of only two species of the genus that has its flowers in small erect clusters rather than aggregated in a globular or cylindrical spike. It is an ancient species, a living missing link, with features intermediate between most *Banksias* and the related genus *Dryandra*. It favours yellow sandplain, and has been reduced to a few remnant populations due to clearing of light lands in the central wheatbelt. (Photo S.D. Hopper)

Australian Heritage Commission Grant

The Australian Heritage Commission has awarded a total of \$45 000 to the project, \$20 000 of which was spent in 1982. The remaining \$25 000 will be used over the triennium 1983-85.



▲ An open low woodland of *Eucalyptus stoatei* in vacant Crown land being considered for release for new farms. Although this ornamental tree of the Ravensthorpe district is abundant, it has a geographical range of only 50km, and only about 200 plants are known to occur on existing nature reserves. (Photo S.D. Hopper)

Work completed in 1982 included collation and mapping of all available information on wheatbelt plants thought to be rare or to have geographical ranges of less than 100km. The accompanying map shows areas where these plants are concentrated. Included are farming districts centred on Mogumber-Bindoon, Wongan Hills, Pingelly, Cunderdin, Quairading, Mt Lesueur, Geraldton, Northampton, Ongerup, and Ravensthorpe.

Following this collation of available information, specific areas were selected for survey by consultants K.A.G. Millar, M.A. Burgman and S.J. Patrick. Usually two or three plants occurring in the same area were selected for detailed work, and a watchful eye was maintained for a number of others that could turn up in the same area. Several of the plants surveyed are illustrated in the accompanying photographs.

Cunderdin-Quairading Survey

Ms K.A.G. Millar searched for three rare and three presumed extinct species in this area during July and August of 1982. Of the three rare species, *Hakea aculeata* (Column Hakea) was found to be the most endangered. Sixteen populations, containing an estimated 375 plants, were located, all on road verges or small areas of bush on private property. Careful management of these areas will be essential if this species is to survive in the wild. *Casuarina fibrosa* (Wooley Sheoak) failed to turn up anywhere other than its only previously known location, which is in a flora reserve. Some 550 plants of this small pine-like sheoak were counted. A total of 450 *Banksia cuneata* (Quairading *Banksia*) were found at five locations—four on road verges and one (containing 300 plants) on a nature reserve vested in the Western Australian Wildlife Authority. Provided the status of this reserve remains unchanged, this species will be relatively safe from extinction.

The status of the three presumably extinct species that were searched for (*Hakea tamminensis*, *Hemigenia viscida* and *Melaleuca arenicola*) regrettably remains unchanged, as none were seen during the survey.

Mogumber Survey

A survey of nine rare, restricted or poorly known plants in the Mogumber area was undertaken by Ms Millar in October and November 1982. *Darwinia acerosa* (Fine-leaved Darwinia) was located in areas of exposed granite rock at six locations. An estimated 3 400 plants were seen. All occurred on farming property, so



▲ Consultant Botanist E.A. Griffin examines a clump of *Eucalyptus carnabyi* near Cataby on the day of its discovery in 1982. It grows on a road verge, and overlooks thousands of hectares of recently cleared farmland all of which was made available without prior botanical survey. The recently initiated wheatbelt rare flora surveys will improve the chances of plants like *E. carnabyi* being included in nature reserves in new land areas. (Photo S.D. Hopper)

◀ An unnamed species of *Darwinia* from the Carnamah region. The most famous darwinias are the mountain bells of the Stirling Range, but the genus has several representatives scattered throughout the wheatbelt. Some, like the one illustrated, have only recently been discovered, and persist precariously as small remnant populations along road verges or on farms (Photo S.D. Hopper)

▼ *Eucalyptus carnabyi*
One of the rarest eucalypts of the wheatbelts. Only eight plants are known from two locations 80km apart. Pink and white flowered forms have been recorded. This species is probably a hybrid between Motlecah *E. macrocarpa* and Drummonds Gum *E. Drummondii*. The plant illustrated is highly sterile, producing no nuts and with only 3% of its pollen developing normally. (Photo S.D. Hopper)





▲ *Eremophila microtheca*
 Growing to 1 metre tall, this shrub has an acrid pungent odour that emanates from its foliage. It is very rare, being known only from a small population near Eneabba, where it flowers in August. It is one of eight wheatbelt eremophilas that are gazetted as rare or likely to become extinct under the Wildlife Conservation Act. (Photo S.D. Hopper)



► *Eucalyptus stoatei*
 The decorative hanging flowers of this species have red bases 3cm long and 2cm in diameter. The yellow stamens never bend outwards, and thus restrict access to the nectar to a narrow central cavity lined with anthers. This unusual floral structure appears to be an adaptation favouring honeyeating birds as pollinators. For further details, see the *Australian Journal of Botany*, 1981, Volume 29, pages 625-638. (Photo S.D. Hopper)

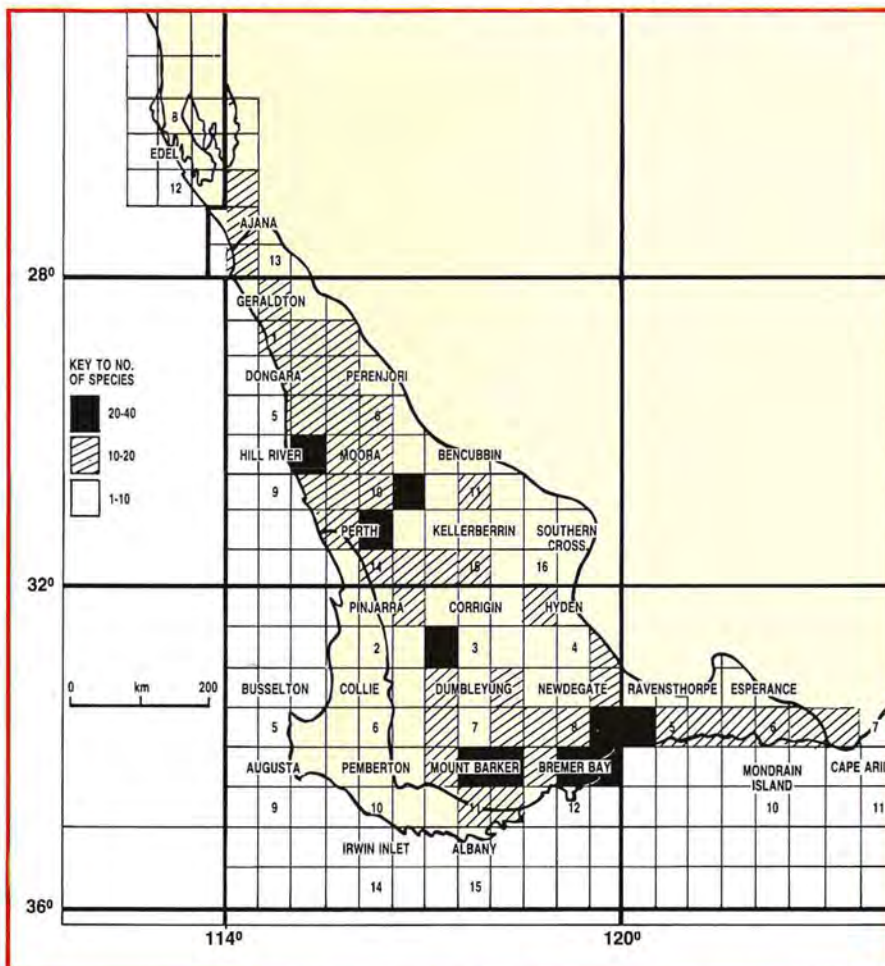
▼ *Lechenaultia pulvinaris*
 The cushion lechenaultia occurs in bare sandy soils in the Wickiepin region of the central wheatbelt. It forms compact mats up to 50cm across. The attractive flowers appear in November. The species has declined due to clearing for agriculture, but faces no threat of extinction because it occurs on several nature reserves. (Photo S.D. Hopper)





▲ *Hemianthra gardneri*
A beautiful ground cover from yellow sandplain country in the Watheroo region. It flowers in August to October, and has foliage that is grey through to green. This rare species persists only on road and railway verges, and on small uncleared areas of farmland. (Photo S.D. Hopper)

▼ Map of the Western Australian wheatbelt showing the density of known rare and geographically restricted species in 30 minute latitude-longitude grid squares.



the long term future of this species is in doubt unless some populations are given total protection. *Darwinia carnea*, the prized Mogumber Bell, was not located in the survey area and is presumably extinct there. It persists in the wild as a small population on a farm near Narrogin.

Urocarpus niveus, the Bindoon Starbush, is equally in danger of extinction. Only one population of two plants was located, and this is on a road verge. *Ptychosema pusillum* (Dwarf Pea) may already be extinct, as no plants were encountered despite a thorough search of the only known modern location and of suitable nearby habitat. Three other poorly known species, *Lasiopetalum rotundifolium*, *Lhotskya brevifolia* and *Petrophile plumosa*, also failed to turn up and are presumably extinct.

One population of *Acacia anarthros* containing 100 plants was located on a road verge and extended into adjacent private property. Although an intense search for this species was not made, the survey indicated that it is extremely rare. *Calothamnus pachystachyus*, the last species surveyed, proved to be very common (60 000+ plants in at least 26 populations) but had a geographical range of only 48km. Fortunately, some populations of this attractive plant were found on conservation reserves, so its future is relatively assured.

Watheroo-Coorow Survey

Consultant Mr M.A. Burgman searched for two rare and three poorly known but restricted species of this area during November-December 1982. *Gastrolobium appressum* (Scale Leaf Poison) was located in 14 populations containing as estimated 2 660 plants, all on road verges, uncleared farmland or railway reserves. *Hemianthra gardneri* (Crimson Snakebush) was equally at risk, with 2 200 plants counted in 6 populations on road verges, farms or railway verges.

Of the three poorly known species, *Regelia megacephala* was found at 5 sites containing an estimated 23 400 plants, all on private land. With a geographical range of only 10km, it is seriously at risk despite its local abundance. Both *Jacksonia*

eremodendron and *Adenanthos stictus* were found to be relatively safe, being widespread and well represented on conservation reserves within the study area.

Wickepin Survey

The beautiful aqua-blue *Lechenaultia pulvinaris* (Cushion Lechenaultia) was the main object of a survey of the Wickepin area by Mrs S.J. Patrick during November-December 1982. Previously only recorded from two localities, the survey recorded a total of 12 populations containing an estimated 4 400 plants. Some 3 000 of these plants occur on nature reserves, while one large population of 1 400 plants occurs on farmland deliberately left uncleared by the owner to conserve the Cushion Lechenaultia. Even though its geographical range has been reduced by agricultural development from 58km down to 19km, Cushion Lechenaultia is comparatively well protected for a rare wheatbelt plant.

A.B.R.S. Grant

The Australian Biological Resources Study awarded a grant of \$25 000 to be expended in 1983 for a flora survey of the mallee belt on the inland margin of current farms between Ravensthorpe and Cape Arid National Park. This region has a flora that is poorly known but apparently rich in species of woody shrubs and mallees. Many of these (at least an estimated 20%) have not yet been named by botanists.

The mallee flora is under imminent threat of broadscale destructions, as extensive areas are being cleared for agriculture or are under consideration for release for this purpose. While a small percentage of land routinely is set aside for flora and fauna conservation in any agricultural land release, government officers responsible for defining boundaries of such reserves have been hampered in the past by a dearth of data on the presence and distribution of flora in specific areas.

Consequently, this newly funded project aims to engage a consultant botanist for two years to survey the mallee flora and to deposit extensive collections in the Western Australian Herbarium as a permanent record on which future studies of the naming, geography and conservation of the



▲ *Eremophila calorhabdos*

Named in 1905 by the German botanist Ludwig Diels, this attractive plant ranges across the margins of current farms in the Ravensthorpe to Esperance region. Its erect stems are up to 3 metres tall. (Photo S.D. Hopper)

flora may be undertaken. Emphasis will be placed on poorly known and presumably rare plants.

During 1983, the botanist (M.A. Burgman) will survey the study area on general collecting trips revisiting sites at least twice (in autumn and spring), allowing two months field work during each season, and eight months for preparatory data collation, processing of specimens and initial appraisalment of the collections made. It is estimated that the field work would entail approximately 30 000km travel. Provided additional funds are granted, areas of special interest would then be surveyed in 1984 to improve knowledge on poorly known and rare species. The final outcome will be a publication listing all the species found, discussing their distribution, and providing a series of maps with proposed reserve boundaries delineated.

A formidable task

Knowledge of the distribution and conservation status of rare wheatbelt plants will be considerably advanced

by the allocation of these federal grants. However, it is sobering to reflect on the size of the task ahead. Some 510 of the known plants of the wheatbelt and its margins are either rare, have a range of less than 100km or their conservation status is poorly known. The total figure could reach as high as 600 when allowance is made for the estimated 20% of the flora that still remains to be discovered and named.

In 1982 it took an average of one month's work per species to complete a survey and write up the results. Detailed searches of 14 species were undertaken, and opportunistic information on an additional 20 species was acquired in the process.

Clearly, at current levels of funding, it will take a considerable number of years to complete a thorough survey. nevertheless, the recently awarded grants, when pooled with State funds, provide an opportunity to make a much needed start on tackling this major conservation problem.

Changes to list of Rare and Endangered Fauna in W.A.

The Western Australian Wildlife Authority, at its meeting of November 18, 1982, endorsed a Department of Fisheries and Wildlife recommendation that additions and deletions be made to the existing schedule of fauna which need to be declared to be species that are likely to become extinct, or rare, or otherwise in need of special protection, as provided in Section 14(2) of the Wildlife Conservation Act 1950.

The recommendations for amendments were made following a review of the existing list by Departmental research staff and are shown in the following list.

PROPOSED DELETIONS

Mammals

Myrmecobius fasciatus rufus – Rusty Numbat.

Replace with full species.

Planigale ingrami – Long-tailed Planigale.

Now known to be common and widespread.

Planigale maculata – Coastal Planigale.

Now known to be common and widespread.

Birds

Puffinus carneipes hullianus – Lord Howe I. Fleshy-footed Shearwater.

Invalid subspecies.

Cygnus olor – Mute Swan.

Not indigenous.

PROPOSED ADDITIONS

Mammals

Macropus eugenii – Tammar.

Now occupies a very small proportion of total range on mainland and is declining in numbers.

Petrogale burbidgei – Warabi.

Restricted to a small area of N.W. Kimberley.

Wyulda squamicaudata – Scaly-tailed Possum.

Restricted to a small area of N.W. Kimberley.

Pseudocheirus peregrinus occidentalis – Western Ringtail.

Declined drastically during the last decade.

Perameles eremiana – Orange or Desert Bandicoot.

Probably extinct. Left off previous lists because of taxonomic confusion with *P. bougainville*.

Isoodon auratus – Golden Bandicoot.

Drastic reduction in range since settlement; now confined to small area of N.W. Kimberley and Barrow Island.

Myrmecobius fasciatus – Numbat.

Declined drastically during last decade and in danger of extinction.

Dasyurus geoffroii – Western Native-cat.

Now restricted to a relatively small area of the south-west; a very small proportion of its former range.

Dasyercus cristicauda – Mulgara.

Extremely rare inhabitant of central deserts. Considerable biological survey work in recent years has confirmed its rarity.

Phascogale calura – Red-tailed Wambenger.

Confined to a few small reserves in the South-west.

Sminthopsis butleri – Carpentarian Dunnart.

In W.A. only known from a small area of the north Kimberley; also occurs on Cape York where it has not been collected since 1898.

Mesembriomys gouldi – Black-footed Tree Rat.

In W.A. only occurs in north Kimberley where it is extremely rare.

Pseudomys chapmani – Pebble-mound Mouse.

Restricted to part of the Pilbara where it appears to have declined since settlement.

Pseudomys occidentalis – Western Mouse.

Restricted to the south-eastern Wheatbelt where it is confined to a few reserves. Not located by Biological Survey of Eastern Goldfields.

Arctocephalus forsteri—New Zealand Fur Seal.

W.A. population less than 2 000, total Australian population approx. 5 000. Numbers greatly reduced by hunting during the nineteenth century and again in 1920. Now slowly recovering.

Balaenoptera musculus—Blue Whale.

In world-wide danger of extinction.

Megaptera novaeangliae—Humpback Whale.

In world-wide danger of extinction.

Eubalaena gracilis—Southern Right Whale.

In world-wide danger of extinction.

Birds

Rallus pectoralis—Lewin's Water Rail.

A very rare inhabitant of fresh-water swamps in the south-west; also occurs in eastern states and New Guinea.

Jacana gallinacea—Comb-crested Jacana.

In W.A. found on a very few Kimberley fresh-water swamps with water lilies.

Pitta iris—Rainbow Pitta.

In W.A. restricted to a few small 'monsoon forests' in the north-west Kimberley.

Microcea tormenti—Brown-tailed Flycatcher.

Restricted to W.A. where it occurs only in mangroves in the Kimberley.

Malurus leucopterus leucopterus—Black and White Fairy-wren.

Restricted to Dirk Hartog Island.

Malurus leucopterus edouardi

Restricted to Barrow Island.

Lonchura flaviprymna—Yellow-rumped Mannikin.

Restricted to a small area of the far north-east Kimberley and adjacent Northern Territory.

Reptiles

Amphibolurus yinnietharra

Restricted to a small area of the Upper Gascoyne where it is dependent on granite outcrops.

Ctenotus delli

Restricted to the northern jarrah forest.

Ctenotus youngsoni

Restricted to Dirk Hartog Island and Edel Land.

Egernia stokesii stokesii

Restricted to the Houtman Abrolhos.

Egernia stokesii badia

Restricted to Baudin Island, Shark Bay.

Lerista christinae

Restricted to the Eneabba—Badgingarra area.

Lerista humphriesi

Restricted to sandplains between Kalbarri and Shark Bay.

Menetia amaura

Known only from Edel Land (Shark Bay).

Aspidites ramsayi—Woma

South-western Australian population has become extremely rare and appears to be close to extinction. Also occurs in south Kimberley, on the Nullarbor Plain and in central Australia.

Python carinatus

Only known from one specimen, north-west Kimberley.

Liasis olivaceous barroni—Pilbara Olive Python.

Restricted to the Pilbara; the largest W.A. python.

Brachyaspis atriceps

Known only from Lake Cronin.

Vermicella calonotus

Occurs only on the Swan Coastal Plain around Perth; from Lancelin to Safety Bay.

After endorsement by the Western Australian Wildlife Authority a *Government Gazette* Notice listing all the Fauna in W.A. which is rare or otherwise in need of special protection was published and the complete notice is reproduced with annotations relating to individual species.

WILDLIFE CONSERVATION ACT, 1950
Department of Fisheries and Wildlife, Perth.

F & W 575/71

The Minister for Fisheries and Wildlife, pursuant to the powers conferred by Paragraph (ba) Section 14(2) of the Wildlife Conservation Act, 1950, does hereby cancel wholly the provisions and operations of the proclamation and notices described in the First Schedule hereto and does hereby declare that the fauna described in the Second Schedule hereto is for the purpose of the Act fauna which is rare, or otherwise in need of special protection.

First Schedule

1. Notice published in the *Government Gazette* (No. 6) of February 3, 1978; and
2. Notice published in the *Government Gazette* (No. 60) of August 29, 1980.

Second Schedule

Mammals

Scientific Name	Common Name	
<i>Macropus robustus isabellinus</i>	Barrow Island Euro	E D
<i>Macropus eugenii</i>	Tammar	E
<i>Onychogalea lunata</i>	Crescent Nail-tailed Wallaby	A
<i>Lagorchestes conspicillatus</i>	Spectacled Hare-wallaby	C
<i>Lagorchestes hirsutus</i>	Western Hare-wallaby	C
<i>Lagorostrophus fasciatus</i>	Banded Hare-wallaby	C D
<i>Petrogale penicillata</i>	Brush-tailed Rock-wallaby	C
<i>Petrogale burbidgei</i>	Warabi	E
<i>Bettongia penicillata</i>	Woolie	C
<i>Bettongia lesueur</i>	Boodie	C D
<i>Potorous platyops</i>	Broad-faced Potoroo	A
<i>Potorous tridactylus gilberti</i>	Gilbert's Potoroo	A
<i>Pseudocheirus dahli</i>	Rock-hunting Ringtail	G I
<i>Wyulda squamicaudata</i>	Scaly-tailed Possum	E
<i>Pseudocheirus peregrinus occidentalis</i>	Western Ringtail	C
<i>Perameles bougainville</i>	Barred Bandicoot	C D
<i>Perameles eremiana</i>	Orange or Desert Bandicoot	A
<i>Chaeropus ecaudatus</i>	Pig-footed Bandicoot	A
<i>Isoodon auratus</i>	Golden Bandicoot	C
<i>Macrotis lagotis</i>	Dalgyte	C
<i>Myrmecobius fasciatus</i>	Numbat	C
<i>Dasyurus geoffroii</i>	Western Native-cat	C
<i>Phascogale calura</i>	Red-tailed Wambenger	C
<i>Dasyercus cristicauda</i>	Mulgara	G
<i>Antechinus apicalis</i>	Dibbler	C or I
<i>Sminthopsis longicaudata</i>	Long-tailed Dunnart	I
<i>Sminthopsis butleri</i>	Carpentarian Dunnart	E
<i>Notomys macrotis</i>	Big-eared Hopping-mouse	A
<i>Notomys longicaudatus</i>	Long-tailed Hopping-mouse	A
<i>Notomys fuscus</i>	Dusky Hopping-mouse	F
<i>Leporillus conditor</i>	Stick-nest Rat	B
<i>Leporillus apicalis</i>	White-tipped Stick-nest Rat	A
<i>Mesembriomys gouldii</i>	Black-footed Tree Rat	G
<i>Pseudomys chapmani</i>	Pebble-mound Mouse	E C
<i>Pseudomys occidentalis</i>	Western Mouse	E C
<i>Pseudomys praeconis</i>	Shark Bay Mouse	E D
<i>Pseudomys gouldii</i>	Gould's Native Mouse	C or I
<i>Pseudomys shortridgei</i>	Shortridge's Native Mouse	B
<i>Dugong dugon</i>	Dugong	J
<i>Arctocephalus forsteri</i>	New Zealand Fur Seal	H J
<i>Balaenoptera musculus</i>	Blue Whale	H
<i>Megaptera novaeangliae</i>	Humpback Whale	H
<i>Eubalaena gracilis</i>	Southern Right Whale	H

Birds

Scientific Name	Common Name	
<i>Phaethon rubricauda</i>	Red-tailed Tropic-bird	G
<i>Stictonetta naevosa</i>	Freckled Duck	C
<i>Cereopsis novaehollandiae grisea</i>	Cape Barren Goose	E
<i>Tadorna radjah</i>	Burdekin Duck	F & J
<i>Aviceda subcristata</i>	Crested Hawk	G
<i>Accipiter radiatus</i>	Red Goshawk	G
<i>Falco peregrinus</i>	Peregrine Falcon	J
<i>Falco hypoleucos</i>	Grey Falcon	G
<i>Megapodius reinwardt</i>	Scrub Fowl	F
<i>Rallus pectoralis clelandi</i>	Lewin's Water Rail	G
<i>Jacana gallinacea</i>	Comb-crested Jacana	F
<i>Anous tenuirostris</i>	Lesser Noddy	E
<i>Ptilinopus regina</i>	Red-crowned Pigeon	
<i>Chalcophaps indica</i>	Green-winged Pigeon	F
<i>Geophaps smithii</i>	Partridge Pigeon	F (C)
<i>Polytelis alexandreae</i>	Alexandra (Princess) Parrot	G
<i>Platycercus haematogaster narethae</i>	Naretha Bluebonnet	E
<i>Pezoporus wallicus</i>	Ground Parrot	
<i>Geopsittacus occidentalis</i>	Night Parrot	G
<i>Cacatua leadbeateri</i>	Major Mitchell's Cockatoo	C or J
<i>Tyto capensis</i>	Grass Owl	
<i>Ninox rufa</i>	Rufous Owl	G
<i>Halcyon chloris</i>	Mangrove Kingfisher	F
<i>Pitta iris</i>	Rainbow Pitta	F
<i>Atrichornis clamosus</i>	Noisy Scrub-bird	C
<i>Coracina tenuirostris</i>	Cicadabird	F
<i>Microeca flavigaster</i>	Lemon-breasted Flycatcher	F
<i>Microeca tormenti</i>	Brown-tailed Flycatcher	
<i>Poecilodryas superciliosa</i>	White-browed Robin	C or F
<i>Falcunculus frontatus</i>	Crested Shrike-tit	C
<i>Psophodes nigrogularis</i>	Western Whip-bird	C
<i>Rhipidura rufifrons</i>	Rufous Fantail	F
<i>Dasyornis brachypterus</i>	Brown Bristle-bird	C
<i>Dasyornis broadbenti</i>	Rufous Bristle-bird	B
<i>Amytornis textilis</i>	Thick-billed Grass-wren	C
<i>Malurus coronatus</i>	Purple-crowned Fairy-wren	C
<i>Malurus leucopterus leucopterus</i>	Black and White Fairy-wren (Dirk hartog I.)	D
<i>Malurus leucopterus edouardi</i>	Black and White Fairy-wren (Barrow I.)	D
<i>Emblema ocellatum</i>	Red-eared Firetail	C
<i>Lonchura flaviprymna</i>	Yellow-rumped Mannikin	E

Birds required to be given special protective measures under Article III of the Agreement between the Government of Australia and the Government of Japan for the Protection of Migratory Birds and Birds in Danger of Extinction and Their Environment.

Scientific Name	Common Name
<i>Pterodroma leucoptera leucoptera</i>	Gould's Petrel
<i>Pterodroma solandri</i>	Providence Petrel
<i>Sula abbotti</i>	Abbott's Booby
<i>Fregata andrewsi</i>	Christmas Island Frigatebird
<i>Pedionomus torquatus</i>	Plains Wanderer
<i>Tricholimnas sylvestris</i>	Lord Howe Island Woodhen
<i>Cyanoramphus novaeseelandiae cookii</i>	Norfolk Island Parrot
<i>Cyclopsitta diophthalma coxeni</i>	Coxen's Fig Parrot
<i>Neophema chrysogaster</i>	Orange-bellied Parrot
<i>Psephotus chrysopterygius</i>	Golden-shouldered Parrot
<i>Psephotus dissimilis</i>	Hooded Parrot
<i>Psephotus pulcherrimus</i>	Paradise Parrot
<i>Ninox novaeseelandiae rayana</i>	Norfolk Island Boobook Owl
<i>Ninox squamipila natalis</i>	Christmas Island Owl
<i>Podargus ocellatus plumiferus</i>	Plumed Frogmouth

Amytornis dorotheae
Strepera graculine crissalis
Pardalotus quadragintus
Zosterops albogularis
Lichenostomus melanops cassidix
Manorina flavigula melanotis
Drymodes superciliaris colcloughi

Dorothy's Grass-wren
 Lord Howe Island Currawong
 Forty-spotted Pardalote
 Norfolk Island Silvereye
 Helmeted Honeyeater
 Black-eared Miner
 Northern Scrub Robin

Scientific Name

Crocodylus porosus
Crocodylus johnstoni
Pseudemydura umbrina
Dermochelys coriacea
Ctenophorus yinnietharra
Ctenotus delli
Ctenotus lanceolini
Ctenotus youngsoni
Egernia stokesii stokesii
Egernia stokesii aethiops
Lerista christinae
Lerista humphriesi
Lerista lineata
Menetia amauro
Aspidites ramsayi
Liasis olivaceus barroni
Python carinatus
Python spilotes
Denisonia atriceps
Vermicella calonotus

Reptiles

Common Name

Salt-water Crocodile
 Fresh-water Crocodile
 Western Swamp (Short-necked) Tortoise
 Leathery Turtle

J
 C
 J

Lancelin Island Skink

E

Spiny-tailed Skink (Houtman Abrolhos)
 Spiny-tailed Skink (Baudin I.)

E
 D
 D

Lined Skink

E
 E

Woma
 Pilbara Olive Python

E
 C
 J
 E
 J

Carpet Snake

E

Amphibians

Common Name
 Round Frog

Scientific Name

Arenophryne rotunda

H.D EVANS
 MINISTER FOR FISHERIES AND WILDLIFE

KEY TO ANNOTATIONS

- A probably extinct.
- B probably extinct in W.A., survives elsewhere.
- C species with drastically reduced range since European settlement.
- D occur only on islands.
- E species with very restricted geographic range.
- F species with very restricted range in W.A., more widespread elsewhere.
- G species with widespread distribution but which are very rare.
- H species greatly affected by hunting.
- I species of uncertain status due to lack of knowledge.
- J in need of special protection.

New Minister Appointed



▲ The Honourable Hywel David Evans, B.A. M.L.A. Minister for Agriculture, and Fisheries and Wildlife, and Minister assisting the Minister for Forests.

Following the 19 February, 1983, State Election—when the Labor Party, led by the Hon. Brian Burke, M.L.A.(now Premier of Western Australia) was elected to office—Mr. David Evans was again elected to Cabinet, with the Ministerial

portfolios of Agriculture, and Fisheries and Wildlife, and Minister assisting the Minister for Forests.

The Hon. David Evans was born in South Wales on 20 December, 1924.

He migrated to Western Australia with his parents when he was two years of age.

Mr. Evans entered Claremont Teachers' College after World War II, graduated in 1946, and gained his Arts Degree from the University of Western Australia after part-time study while employed as a teacher.

He was Deputy Headmaster of Pemberton Junior High School 1958-63, and Senior Master at Manjimup Senior High School 1963-67.

From 1956 to 1962 he was President of the Pemberton Branch

of the Australian Labor Party and was a member of the State Executive of the A.L.P. from 1967-71, and convenor of the Labor Party's Rural and Agriculture Committee, 1968-71.

Mr Evans was elected to the seat of Warren at the 1968 election and has held the seat continuously since then.

Following the election of the Tonkin Labor Government in 1971 Mr. Evans was elected to Cabinet and was allocated the Lands, Agriculture and Immigration portfolios.

In the October 1971 re-allocation of portfolios, he was given the additional Ministry of Forests.

Mr Evans was Deputy Leader of the State Parliamentary Labor Party in 1979-80 and 1981-82, and was Opposition spokesman on Agriculture from 1974 to 1983.

Department of Fisheries & Wildlife District Offices

Head Office: 108 Adelaide Terrace, Perth. Tel. (09) 325 5988

Wildlife Research Centre: P.O. Box 51, Wanneroo. Tel. (09) 405 1555.

Albany:	Stirling Terrace Tel. (098) 41 4811	Karratha:	Welcome Road Tel. (091) 85 1427
Broome:	Hamersley Street Tel. 92 1121	Lancelin:	Gingin Road Tel. (095) 78 1111
Bunbury:	Stirling Street Tel. (097) 21 2598	Ledge Point:	Derburgh Street Tel. (095) 78 1078
Busselton:	12 Queen Street Tel. (097) 52 2152	Mandurah:	15 Leslie Street Tel. (095) 35 1240
Carnarvon:	Fishing Boat Harbour Tel. (099) 41 1185	Manjimup:	Department of Agriculture Tel. (097) 71 1299
Dongara:	Carnarvon Street, Port Denison Tel. (099) 27 1187	Moora:	Padbury Street Tel. (095) 41 1055
Esperance:	Wallaceway Centre Tel. (090) 71 1839	Mt Magnet:	Hepburn Street Tel. (099) 63 4174
Fremantle:	Collie Street Tel. (09) 335 6369	Pingelly:	Park Street Tel. 273
Geraldton:	Fisherman's Wharf Tel. Wildlife — (099) 21 3510 Fisheries — (099) 21 1956	Shark Bay:	Knight Terrace, Denham Tel. (099) 48 1210
Jurien Bay:	Bashford Street Tel. (095) 48 1048	Waroona:	PWD, S-West Highway Tel. (095) 33 1331
Kalgoorlie:	Maritana House, Boulder Road Tel. (090) 21 4148	Wongan Hills:	Quinlan Street Tel. (096) 71 1395
		Wyndham:	PWD, Sharp Street Tel. 61 1342

WILDLIFE DISTRICTS IN WESTERN AUSTRALIA

