PLAYING POSSUM

by
Gary Inions and Helen Bradbury

Stumbling through jarrah forest late at night with the "beep" of a receiver as your only guide makes it easy to understand how the phrase "playing possum" has come to mean keeping quiet, watchful and deceptively docile. There was a surprise on this particular occasion when, after some time tracking a young female brush-tailed possum (affectionately named "Sheryl") we had to admit being completely stumped. The frequency of the "beep" was at its loudest. That meant that she had to be right at this spot, yet there was no sign of her either feeding on the ground or in a tree. Then we saw it — the transmitter tossed on the ground, the metal collar snapped open. She could be anywhere by now. This was a blow because we had not tracked such a young possum before and although we had followed her periodically for six weeks, this was not sufficient time to accumulate comprehensive information. Why did she travel so far, and why so randomly? What would be the extent of her home range? How would she find a mate? When? During the six weeks she had moved a lot through many jarrah and marri trees in the Perup forest east of Manjimup. Because she was on the ground so much feeding on grasses and shoots, we had found her easy to locate when tracking. Like all possums, which are tree-dwelling mammals, her movements on the ground were cumbersome and slow. This meant that she would be easy prey for foxes. Would she be a survivor?

In comparison, "Cuthbert" was a survivor. We'd been tracking this male brush-tailed possum periodically for three months now and were accumulating a lot of data on his movements and habits.

Fig. 7.

Radio tracking possums during burning operations. *T. Leftwich*

Cuthbert leads a reasonably comfortable life high up in the hollow of an old marri tree. Unlike Sheryl, he has established and appears to defend a limited home range featuring only one home tree. Perhaps Cuthbert is just getting old, or maybe he dosen't need to roam far for food. His home range is surprisingly small. The marri he inhabits is in an area in the Perup forest that has been recently burnt by wild fire. The trees have been regenerating after the burn, providing delicious epicormic leaves and shoots near the nesting holes of possums. Because he does not spend so much time on the ground Cuthbert is less vulnerable to predation. But what would have happened to him had his home tree been destroyed by the fire? Would he have been destroyed also?

WHY STUDY POSSUMS?

The brush-tailed possum *(Trichosurus vulpecula)* has an amazing ability to adapt to, and colonize, new surroundings. In the eastern states of Australia damage to new shoots in pine plantations has caused alarm, and in New Zealand, the introduced possum has spread at an alarming rate causing damage to the local vegetation and affecting associated industry (for example, apiary). Most research into the possum has been stimulated from the fact that in these areas, it is a pest.

In Western Australia these marsupials are no nuisance, but we need to know how forest-dependent animals and birds are affected by forestry operations and related activities, such as logging, clearfelling, prescribed burning and mining. Gradually, the Forests Deparment Manjimup Research station is

Forests Department researchers use techniques such as spotlights at night to record the number of possums and observe their behavour. *N. Burrows* ►

accumulating facts about species of forest fauna. Possum research aims at investigating the effects that logging and prescribed burning in particular have on our most common arboreal mammal. Research techniques include radio telemetry, spotlight surveys, analysis of faecal remains, trapping and observation, and field searching. Little is known about the ringtail possum *(Pseudocheirus peregrinus)*, the other species of possum once common in Western Australia. Although researchers occasionally encounter them, studies are difficult to conduct on this species, as they rarely appear.

IN THE ROOFTOPS

Historically, the brush-tailed possum has been one of the most familiar marsupials to Australians, many of whom would have experienced possums residing in their roofs, or stealing fruit from their orchards. During the last century possums provided a ready source of food for the early settlers, as well as a source of income. Brush-tailed possums were prized for their fur, pelts being worth 2s. 6d (25 cents) a dozen at the turn of the century. Possum skins were sold on the world market as "Australian opossum", and sales were exceeded only by the pelts of one other animal, the North American muskrat. The fur trade continued into the years of the

Caught by the spotlight, this possum ► shows how scratch tracks are made when climbing trees. *N. Burrows*

▲ This is a well used possum tree with a pronounced scratch track up its trunk. *G. Inions*

▼ A typical possum tree in the area has a broken top that has formed a hollow in which the possums can live. *G. Inions*

Great Depression when the price of a dozen possum pelts had risen to 15 shillings ($1.50).

With European settlement and the opening up of forested areas for agriculture, the distribution of the possum in Western Australia gradually declined until the present day when numbers, not precisely known, are believed to be reduced to areas of dry schlerophyll forest with main populations south of Collie. The rapid reduction in possum numbers just after the Great Depression, combined with current data on predation of possums, leads us to believe that the introduction of the European red fox *(Vulpes vulpes)* to Western Australia in the 1930s has been a major threat to possum species.

POSSUM TREES

Possums depend on trees for shelter and food. In the Perup Management Priority Area (M.P.A.), two areas of 36 hectares and 21 hectares respectively, each inhabited by possums, were chosen by researchers to observe the effects of logging on "possum trees", and to investigate the effects of high intensity autumn fire on the trees and on the possums themselves. The first step was to conduct a survey to record the number and type of possum tree in each area. This was done on a grid pattern followed by actually tracking individuals to their home trees. A tree was classified as a possum tree if it possessed a visible scratch track up the trunk showing habitual use by possums, leading to a hole which appeared inhabitable. We found that possums preferred trees with certain characteristics, but these were not associated with specific tree species. Possums showed no preference for jarrah *(Eucalyptus marginata)* marri *(E. calophylla)* or flooded gum *(E. rudis)* when choosing nest trees. Rather the presence of a suitably sized hole seemed to be the critical factor. As trees form holes from broken branches or tops, we found most possum trees to be dead or decadent (that is, old and in declining condition), and no tree was smaller than 40cm in diameter.

LOGGING

The effect of logging on the possum trees in the area was assessed by counting up the number of stumps left from logging operations of 12 years ago, and comparing this with the number of trees still standing that support a possum population. Some assumptions need further research. As possums inhabit decadent trees, which are of poor quality timber, then it would seem that logging would not have a great effect on possum populations in the short term. In the long-term view, logging perhaps affects the number of trees which can grow to maturity and develop the required habitat characteristics.

BURNING

One area was burnt with a "hot" autumn prescribed burn, intended to improve the habitat for tammars and woylies (see *Forest Focus 25*), and the possum trees were relocated after the burn to assess the amount of damage (see figs. 8 & 9). We tracked individual possums before, during and after the burn. The fire had a marked effect on the possum population in the area both directly, and indirectly by destroying or damaging their nest trees. The trees which were most suitable for nesting were most severely affected by the burn.

The behaviour of the tracked possums during the fire was observed closely. Their most common reaction to the burn was to remain inside the hole in the nest tree and sit the fire out. If the tree caught fire, then the possum would probably be destroyed. This was confirmed by one individual that was wearing a radio transmitter. Other possums that survived the flames died later from injuries during the burn, and some individuals survived.

Fire is a natural part of the environment in which possums live, and they have adapted to cope with such catastrophic events, so the area was soon re-colonizing with young possums from other areas. Epicormic growth on the trees stimulated from the fire was an attractive food source, attracting possums like Cuthbert to the burnt area. And although old trees were lost in the fire, burning created holes in trees that were not previously inhabitable. We can say that wild-fires do affect individual possums, but can't say that the species is adversely affected. Possums did survive in the burnt area and then together with others from neighbouring unburnt areas of forest re-colonized the area successfully in a short time. The rapidity with which such a burnt area is re-colonized depends to some extent on the size and proximity to each other of prescribed burn areas (see *Forest Focus 25*).

RE-COLONIZATION

The brush-tailed possum has a remarkable ability to re-colonize areas that have been affected by burning, or to colonize new areas. This adaptability is largely related to its mating and territorial habits. After the young are born and

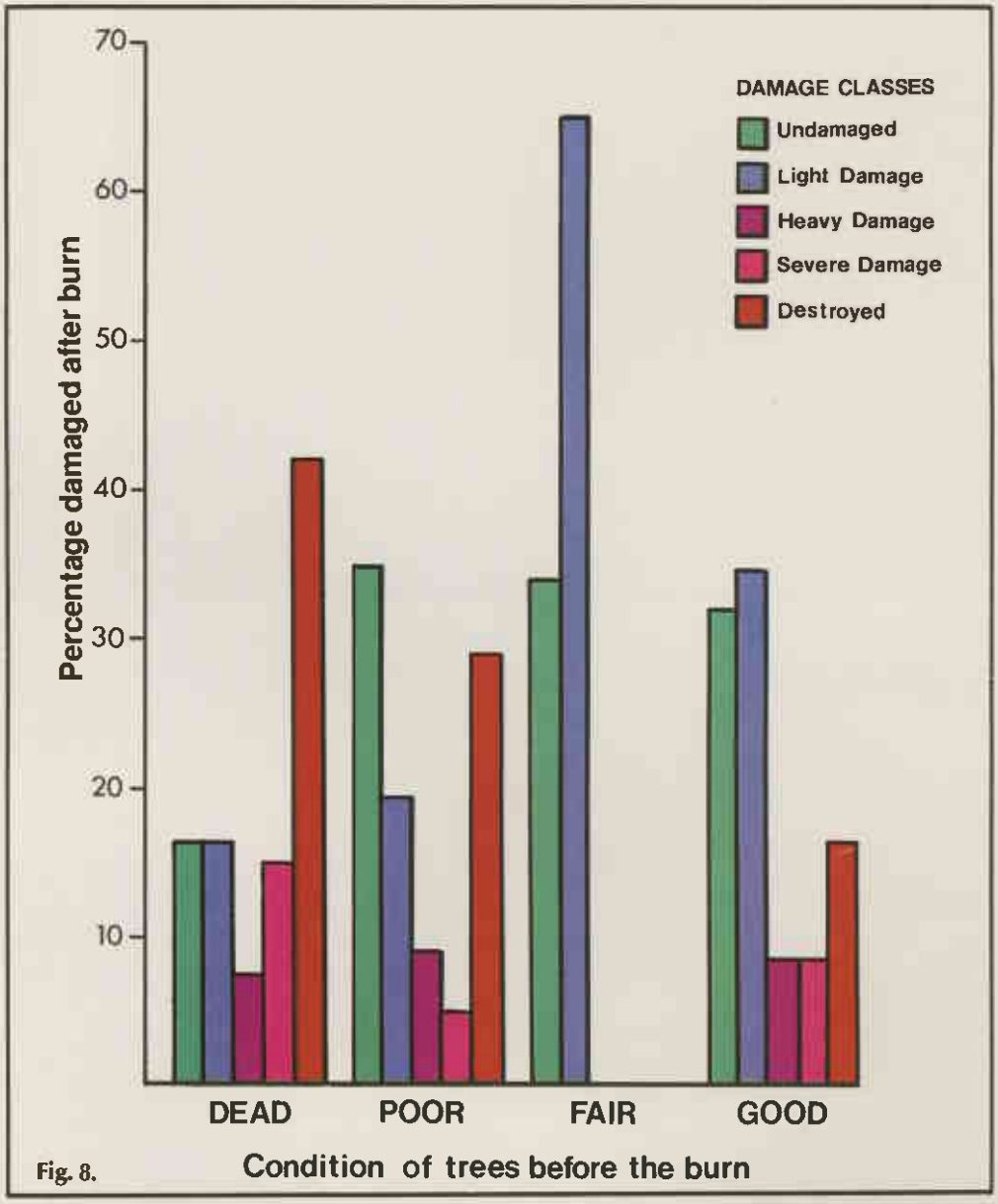


Fig. 8.

Immediately after the burn there is little green vegetation left. *T. Leftwich*

The same area only months after the burn provides food for re-colonizing possums. Note the abundance of epicormic growth from the trunks of the trees. *G. Inions*

A macabre silhouette - a brush-tailed possum hangs on to a branch as its habitat burns around it. *T. Leftwich*

MAP OF STUDY SITE (POST BURN) SHOWING RELATIONSHIP BETWEEN FIRE INTENSITY AND POSSUM TREE DAMAGE

LEGEND

° Possum tree, inhabitable after burn
x Possum tree, uninhabitable
– Boundary road of burn area

1. COOL:	0 to 300 kwm-1
2. WARM:	300 to 500 kwm-1
3. HOT:	500 to 1000 kwm-1
4. VERY HOT:	100 to 1400 kwm-1

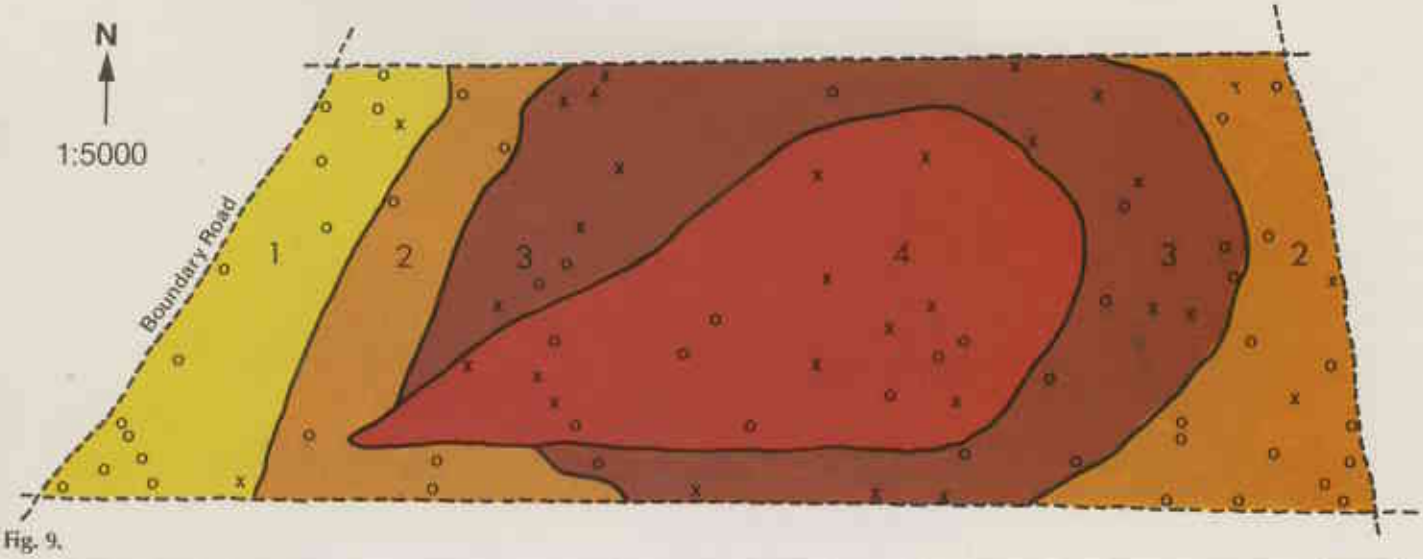
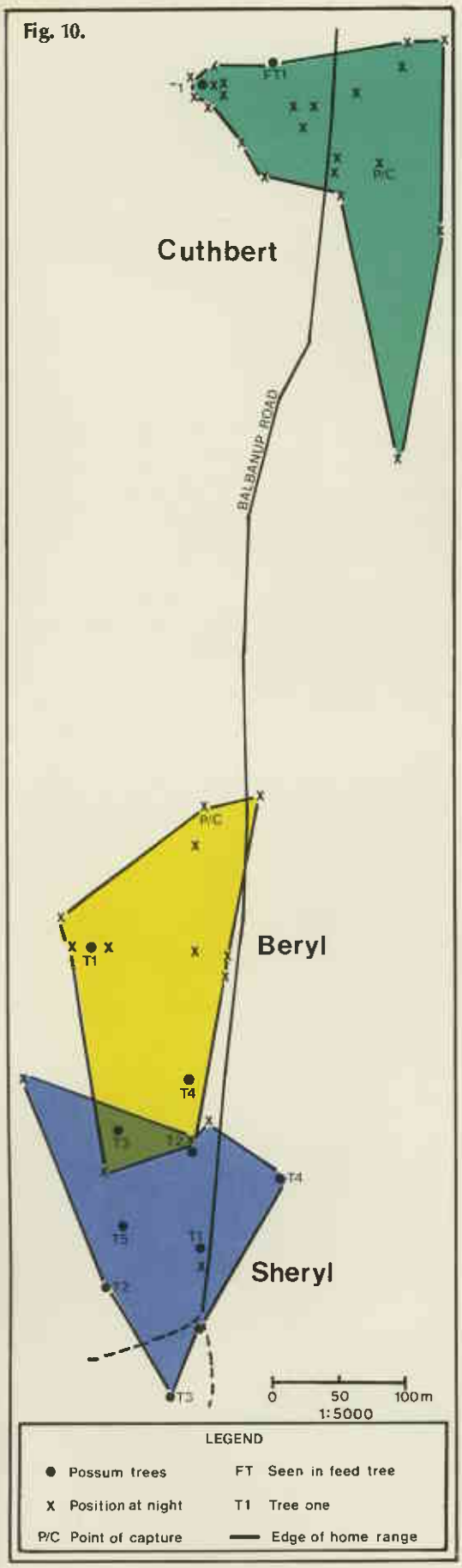


Fig. 9.



◄ Home ranges of Sheryl, Beryl and Cuthbert. Note the overlap between the females' territories and the broad distances between sightings. In comparison Cuthbert usually sticks to a more limited area.

weaned they move abroad, out of the home range of the parent possums. Young males in particular, are forced to find new territory, as they are likely to clash with older, established males. Females on the other hand, are not so territorial, as the study of Sheryl indicated. She shared part of her home range area with "Beryl", an older female who is more established than Sheryl (see fig. 10). Female possums appear to move freely through a male's range, but established males avoid each other as far as possible. Cuthbert's feeding behaviour has been observed to be strictly within the limits of his territory - for instance, he just never goes south of his home tree (T1) when searching for food. Also, we have observed male possums that appear to vie over the favours of a female, the female moving into the nest tree of the male that dominates.

Research has been continuing for over 12 months now and gradually we are piecing together information about these appealing creatures. There is much to find out and the work is slow, requiring many hours tracking and surveying, waiting and watching. Doubtless there are many more surprises in store. "Playing" possum may not involve too much play for us, but getting to know the brush-tailed possum makes rewarding work.