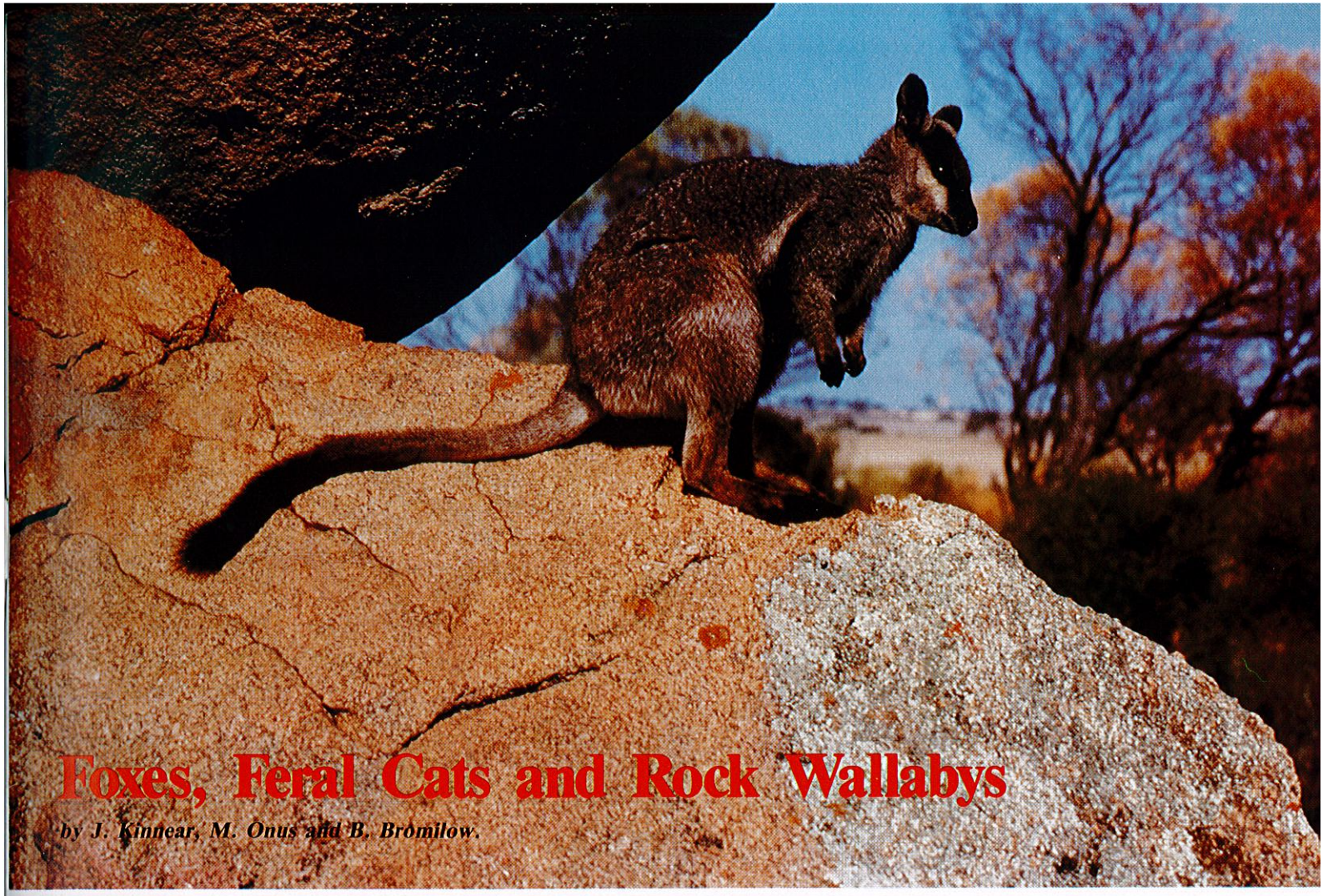


Foxes, Feral Cats and Rock Wallabys

by J. Kinnear, M. Onus and B. Bromilow.

▲ Black-flanked rock wallaby (*Petrogale lateralis*) of the granite rocks area of the wheatbelt (Photo copyright A.G. Wells).

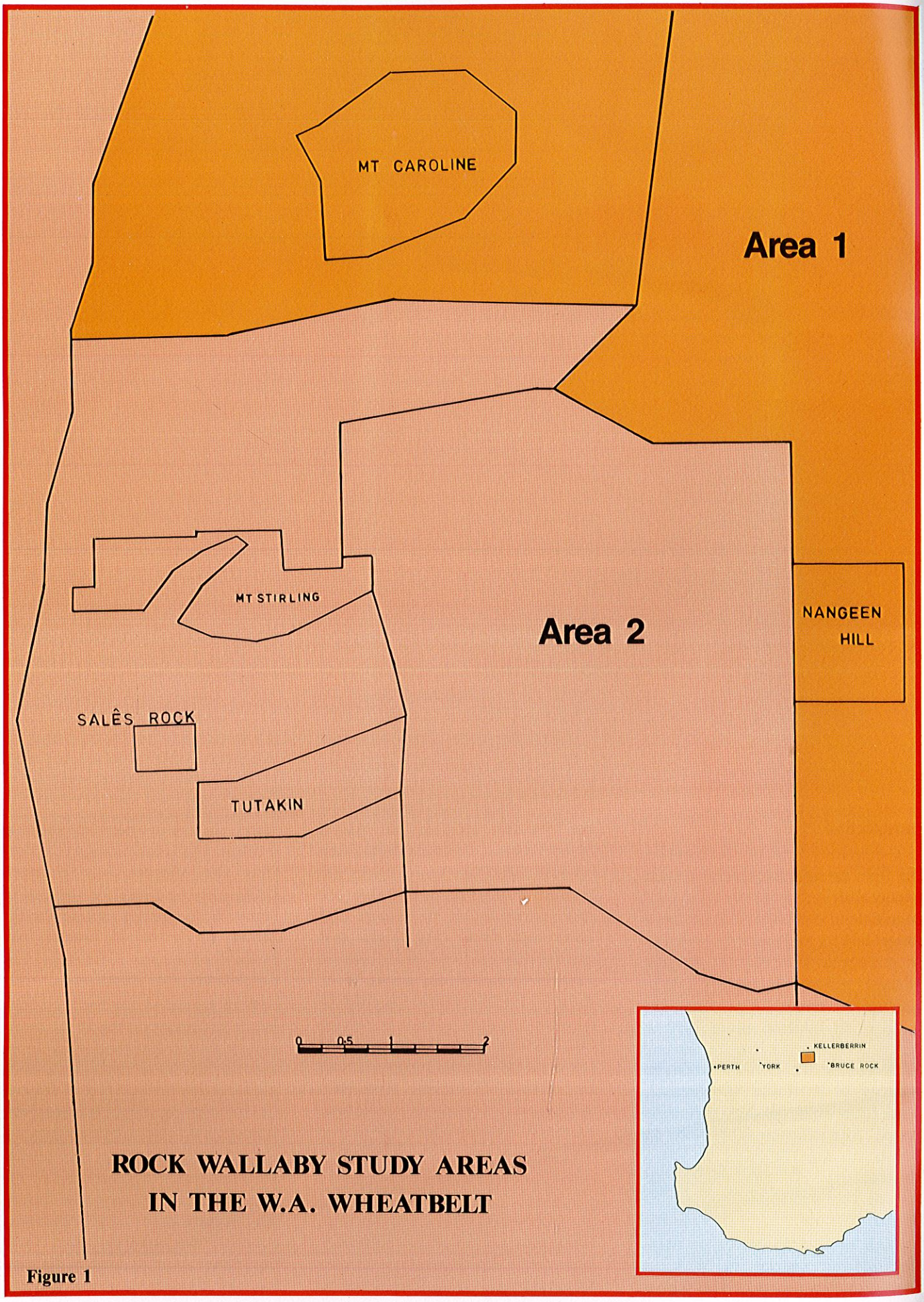
Introduction

Two species of exotic mammals – the feral cat and the red fox – are widely distributed throughout most of mainland Australia. The cat has a longer history and possibly landed as a shipwreck survivor or through Malays trading with northern coastal aboriginal tribes. The fox was deliberately released about 1870 in Victoria so that the English pastime of following the hounds might be pursued in Australia. Apparently, those foxes which escaped the hounds found Australia a good place in which to raise families. By 1916 decendants of the Victorian introduction had found their way to W.A.

With the establishment of these two foreign species in W.A. a question follows, namely "Has the cat and the fox affected our native fauna?" This is a reasonable question because, after all, both species are genuine carnivores, and it does not seem unreasonable to suspect that foxes and feral cats might just exercise their carnivorous instincts on suitable species of our native W.A. fauna. Furthermore, suspicion becomes stronger when it is realized that, associated with the arrival of the fox in particular, a number of small to medium sized mammals subsequently became rare or extinct on the W.A. mainland.

However, the factors that cause extinctions of species are usually complex and are seldom documented. For some species (e.g. wheatbelt mammals) habitat destruction was particularly severe. The rabbit plagues must have had an effect, disease has been advanced as a cause, and some biologists believe that the climate has changed sufficiently to affect the survival of many W.A. species. These factors acting singly or in concert are plausible explanations and need to be considered.

With regard to the fox, opinions about its impact on the W.A. fauna vary from outright condemnation to indifference. One viewpoint (which dismisses the fox as a factor) equates the fox with the dingo, it is reasoned that since the native species have co-existed with the dingo for several thousand years then why should the coming of the fox worry the fauna? An extension of this reasoning concedes the possibility that foxes may have caused damage in the past, but the damage is done and the



ROCK WALLABY STUDY AREAS IN THE W.A. WHEATBELT

Figure 1

surviving species have learned to live with the fox – relax, why worry? This is the so-called "equilibrium theory" of species living in harmony where the "balance of nature" forces are operating.

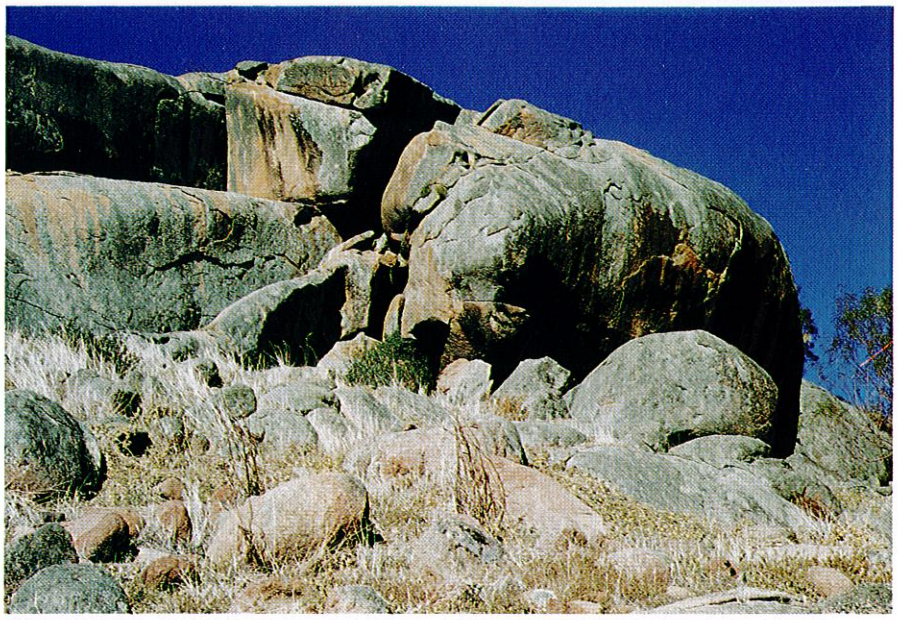
The Rock Wallaby Study

In 1978, we began a study on rock wallabies *(Petrogale lateralis)* in the central wheatbelt where colonies still persisted on some granite outcrops south of Kellerberrin. A survey of these sites revealed that the numbers had declined. We estimated that the total population consisted of about 75 animals; one population had become extinct during the last 10 years and 2 more were nearly so. During this initial phase we sighted and encountered many foxes and feral cats, but we had no cause at this stage to link them to the decline of the rock wallaby colonies, however, as the study progressed, this attitude was to change markedly and these alien species subsequently became the focal point of the study.

By the end of 1978 we realized that it was important to try and collect some vital statistics on rock wallabies, it was essential to gain some information about things like – the number of wallabies occupying a rocky outcrop, how many babies were born each year, the age of individuals and so on. If it is possible to collect such information, then one can gain some insight into why the colonies of rock wallabies were so small and therefore prone to extinction.

In order to gain such information it is necessary to catch wallabies and measure the length of their foot, check their teeth, check in their pouches for young, fix a numbered tag in each ear and then let them go. All of these activities are routinely performed in most population studies involving wallabies.

Now trapping wallabies is usually not very difficult, we soon learned that rock wallabies considered apples equivalent to lollies, and so it is easy to get them to enter a trap but keeping them there was a problem.



▲ "The Granites" near Shackleton W.A. illustrates the type of rocky outcrops that occur in the wheatbelt and the crevices of which protect rock wallabies that are still surviving in the wheatbelt. (Photo copyright A.G. Wells).

▼ Rock Wallaby trap successfully developed to capture rock wallabies in the wheatbelt without injuring the animals (Photo J. Kinnear).

▲ Enderby Island W.A. The relative isolation of the island from mainland predators has probably assisted the rock wallaby population in its survival within the open habitat of the island.

After modifications which seem adequate to trap any normal wallaby, they still proved to be agile escape artists, at this early stage we found it an easy job to clear the traps because we never caught any, and we used to complain that for our efforts the least rock wallabies could do was to leave a note thanking us for the apple.

When we finally made the traps secure we began to catch wallabies, but it soon became apparent our problems were just beginning, we found that if a rock wallaby cannot escape from a trap it will propel itself upwards with great force and injure its head if measures are not taken to prevent this. What we failed to appreciate was that rock wallabies live in a three dimensional world where up and down is just as natural as straight ahead. After many trials, a trap ingeniously designed and built by Robert Bromilow allowed us to trap rock wallabies virtually without risk.

From our trapping endeavours it was learned that rock wallabies breed continuously throughout the year, and that most adult females were carrying young in their pouch. Moreover, the population was fit and healthy and did not suffer excessive weight loss during drought. Additionally, we learned that the population consisted of mostly mature animals and was not increasing despite the fact most females were bearing young, this information suggested that the reason why the populations were not increasing was because once a juvenile leaves the mother's pouch, it had a low probability of surviving to adulthood.

As evidence from trapping began to build up, our suspicions regarding foxes and feral cats began to grow. Foxes and cats were found to be living in the rocks amongst the rock wallabies, bones of wallabies were recovered from a fox den and rock wallaby hair was found on a firebreak some distance from the rock. We noted that rock wallabies were only found in rock piles that afforded protective shelter in the form of crevices and deep caves, whereas in the past, they were recorded from sites which offered far less protection.

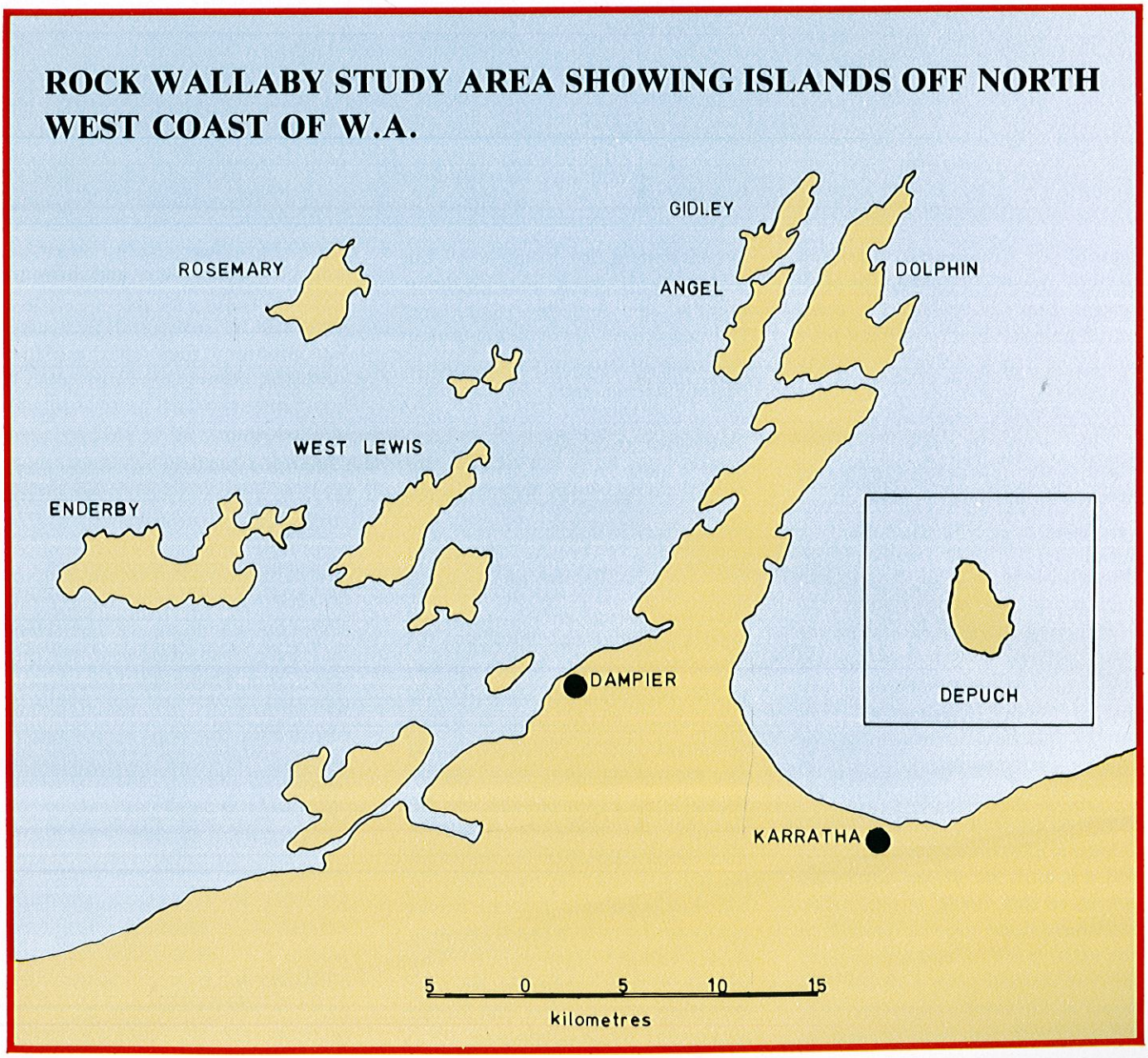
Meanwhile some evidence from studies in the Pilbara served to reinforce our suspicions about the possible effects of foxes and cats. On islands in the Dampier Archipelago another rock wallaby species — Rothschilds' rock wallaby *(Petrogale rothschildi)* — is found on 3 islands, two islands are free of foxes and cats and support thriving populations of

rock wallabies, in contrast the third island, which has foxes and cats, has very few rock wallabies.

To illustrate the differences in numbers between these islands consider the information gained when an observer records the number of rock wallabies seen per hour on a standard traverse of an island (such procedures provide measures of relative abundance). On the islands free of foxes and feral cats (Rosemary and Enderby Island), one routinely observes 12-15 rock wallabies per hour, while on the island that has these predators (Dolphin Island), one sees on average 1 rock wallaby per 3-4 days! This difference is even more striking when one compares population sizes between the islands. On Enderby (fox free), we estimated that there were about 1500 rock wallabies, while on Dolphin, less than 50.

Further north more incriminating circumstances are found on Depuch Island which is an island a few kilometres offshore and due west of Whim Creek. In 1962 the W.A. Museum surveyed Depuch Island and recorded the presence of the rock wallaby *(P. lateralis)* and the fox. Dr. D. Ride, former Director of the Museum, wrote in his report — "tracks of foxes were numerous; . . . fox droppings containing fur bone fragments and arthropod remains are common; and the remains of rock wallabies that had clearly been eaten by a carnivore were to be found in many of the valleys near fresh water and behind the beaches". In his summary of the situation Ride concluded . . . "Today, rock wallabies seem to be present on the Island in large numbers and it seems that foxes have not been successful in reducing the population to a low level. However, there are obvious

ROCK WALLABY STUDY AREA SHOWING ISLANDS OFF NORTH WEST COAST OF W.A.



▲ Rothschild's rock wallaby (*Petrogale rothschildi*) was the species studied in the islands off the north west of W.A. (Photo copyright A.G. Wells).

signs of predation both by foxes and birds of prey and we cannot be at all certain that the relatively recent introduction of the fox will not have some long term effect on the wallaby population".

Ride was obviously uncertain about the outcome of this predator/prey system involving a marsupial and alien predator which has recently become established on Depuch Island. In 1962 the relationship seemed to be at equilibrium, but 20 years later when we visited the Island, we found no trace of the rock wallaby *P. lateralis,* foxes were still there, foraging in the intertidal zones on the beaches, so much for the equilibrium theory and the balance of nature arguments.

Such evidence is rather compelling and it is hard not to feel absolutely convinced that foxes, in particular, must have done a lot of damage to our native wildlife, and indeed also, that the fox still poses a threat. But strong as the evidence appears, it is still circumstantial, it still is easy to be mislead as for example by the difference between rock wallaby numbers on Enderby Island and Dolphin Island, we now know that this large difference in abundance is partly environmental. Research has shown that Enderby is a better place to live for rock wallabies because there is more food, but even though food accounts for some of the difference in numbers, it still does not completely explain why there are so few rock wallabies on Dolphin Island.

Given the above situation, and the circumstantial nature of the evidence, it was decided that an ecological experiment might provide more definitive evidence. Two opportunities for experimentation were readily apparent as for example in the Dampier Archipelago. A useful experiment would involve eliminating the fox and feral cat from Dolphin Island, a population increase would signify predation as a factor affecting rock wallaby abundance. The wheatbelt rock wallabies afforded even better opportunities, and for this reason this area was selected.

For the wheatbelt experiment we divided the 5 rock wallaby populations into 2 zones or areas (see fig. 1). In area 1 foxes and feral cats were to be eliminated or at least their numbers significantly reduced. In area 2 things were to be left alone – that is, no effort to control foxes or feral cats was to be made at all. The outcome of this experiment should shed some light on the following possibilities namely:

(1) rock wallaby numbers should increase in the zone where foxes and feral cats are eliminated if these predators are responsible for keeping the numbers low;

(2) at the same time little or no increase in rock wallabies should be observed where nothing was done to keep the numbers of foxes and feral cats down.

While it is easy to plan and design experiments such as the one outlined above, the implementation of the actual experiment has not been easy and has required a sustained commitment to see it through. At the start of the experiment we needed to know two things – how many rock wallabies there were and how to eliminate (or at least reduce significantly) foxes and feral cats. The Bromilow trap solved our first problem, the other problem is another story which must wait until another issue.

At this writing, 2 years have elapsed since we have trapped the rock wallaby populations, in the meantime intensive fox control studies have been carried out. It is not possible to predict the outcome at this stage, but a preliminary assessment may be possible this year for one population. Hopefully, the outcome will allow us to reach some conclusions one way or the other. Whatever the answers, it should be an interesting story to tell.