

FAUNA

BATS, THE FORGOTTEN INSECT EATERS

by Tony Start

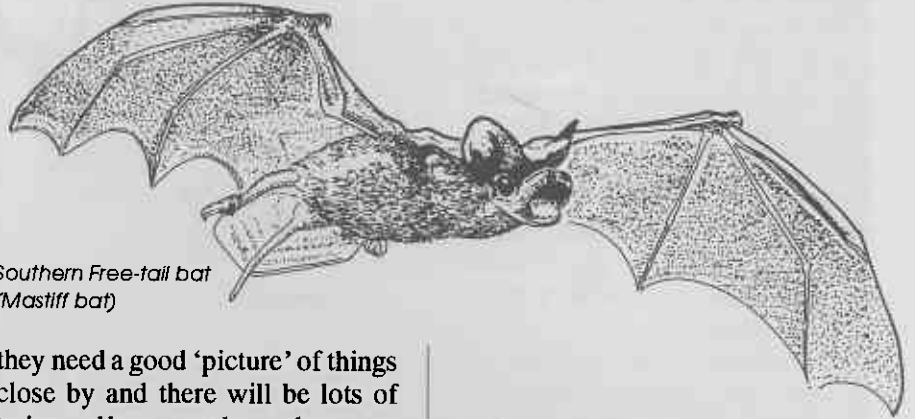
ON moon-less summer nights you have, undoubtedly, heard a metallic tik---tik---tik---tik (about one per second). Perhaps you've let it pass unnoticed, but listen for it next time you are out on a warm, dark evening. Notice that, unlike the crickets which chirrup from some fixed vantage point, this call will be up high. It will come in from one direction and pass overhead before fading into the night.

You have heard a mastiff bat as it hurtles through the air in search of insects to eat (unless you live in the tropics where some other bats that make sounds audible to humans). Wait long enough and you may hear the tik---tik give way to a buzz then return to its measured pace.

tik---tik---tik---tik--tik-tik-tik-tik-tik-tik---tik---tik---tik

Now you have witnessed the bat homing in to capture and devour an insect. Mastiff bats are the largest of our south western bats, weighing up to 40 grams. They have solid bodies and long, narrow wings which enable them to fly fast. They hunt over the tree tops in clear air where they do not need to be particularly agile; there are few obstacles. However, they must be able to detect prey at some distance and so their echo-locating 'tiks' are at the lower end of the frequency range used by bats because lower frequency sounds carry further. That is why we can hear them.

There are other species of bat hunting around the edges of the canopy, in between the trunks of trees or even in quite dense scrub, all searching for insects to eat. You will not see them as they flit in the dark but you may catch a glimpse in the car's headlights or around an outside light. You will not hear them either for they are using much higher frequency sounds than the mastiff bats. In their more cluttered air-space they do not need to 'see' as far ahead as the mastiff bats, but



*Southern Free-tail bat
(Mastiff bat)*

they need a good 'picture' of things close by and there will be lots of twigs and leaves to clutter the scene. The higher sound frequencies have shorter wave lengths. They give a finer resolution which suits the needs of the bats which hunt in and around vegetation.

There are about nine species of bats in the south west of WA. The exact number depends on where you draw the boundary, as well as some technical problems because biologists are still discovering new species that had been confused with previously well known ones. That does not detract from the fact that we have more species of bat than any other group of mammals in this area. They really are the forgotten mammals and that is a pity because they can play a very significant role as insect predators so long as their ecological requirements are met.

There are places where the bat fauna is intact. That is to say all the species which once occurred there are still there, hunting insects and playing a vital role in keeping the balance of nature on an even keel. We have already seen that the mastiff bats fly fast, above the tree tops, on long narrow wings whilst others hunt in quite dense forest or scrub. The latter have short, broad wings, more suited to manoeuvrability than speed. There are parallels in the design of aeroplanes. Jets compared with crop-dusters are the extremes. Just as we sometimes need planes that are a little more manoeuvrable than jets but a little faster than crop-dusters, there are ecological niches

for bats with a variety of different flight capabilities.

If you trace the wing-shape of all the bats in an intact community and compare various parameters that determine each one's flight capabilities, such as speed and agility, you will find that each species has a unique design. Each one is able to exploit the insect resources of a particular part of the habitat, be that over the tree tops, beside the canopy or inside the forest. Finer niche divisions are brought about by the way the bats hunt. Some take all their food on the wing, like swallows do, while others can glean insects off surfaces. The long-eared bats, for example can pick insects off the ground. To complement its flying ability each species of bat uses echo-locating calls of a frequency ideally suited to its mode of hunting in its habitat niche.

However, if the habitat has been altered in any way that eliminated the essential resource requirements of any of the bats, there will be losses to the array of species that lives in that area. That may have flow-on effects because the predators of an ecological community have been removed. Perhaps the two most important resources that a community of bats requires are roost and breeding sites and suitable habitat in which there are insects to eat. This is where *LAND FOR WILDLIFE* can make so much difference.

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It is a common misconception that bats must have caves in which to live. Certainly there are some species in arid and tropical areas of WA that need caves or rock crevices (and there are some south west species that can exploit them) but all our bats live in trees. Some, like the mastiff bats, need hollow branches, but others, for example long-eared bats, will live under loose slabs of paperbark or beneath the shedding bark of dead trees, sometimes no more than a meter from the ground.

However each species is particular about the size or position of its hollow, or the orientation of its retreat. For example, on the coastal plain near Perth, long-eared bats have been found roosting under dead banksia bark, choosing the side that is warmed by the evening sun on fine winter days. But they move to the better insulated shelter of a paperbark site on wet days. The lesson is that a community of bats requires a diverse array of roost sites to choose from. It will include old trees with a selection of hollows as well as other features such as dead trees that are shedding bark, paperbarks or anywhere off the ground that offers shelter and seclusion. Sometimes old bird's nests are used by bats.

Let us consider two components of the other important resource, food. Firstly insects must be available, at least during warmer nights when bats are hunting. The widespread use of agricultural insecticides can reduce food supplies and poison the bats. No amount of good habitat will help in that case but that is rare today. Secondly, habitat of the type each species is adapted to must be available. As the mastiff bats hunt in the clear air spaces above the canopy, it matters little to them whether there is bush or grass below. They can hunt over pasture, crops or forest. However the number of insects available to them may change with the land use under their hunting areas and this may affect the number of bats in the population. On the other hand

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Lesser long-eared bat

cleared land will be of no use to long-eared bats that fly with ease in thick vegetation, gleaning insects, or the wattled bats that hunt in the open air but close to the canopy.

How can we make sure that our bat communities are accommodated in the landscape we have created? We need to keep as many trees as possible including the old ones because they have hollow branches, and even dead ones because (besides any hollows they have) their shedding bark and even the splits that develop in their trunks, can provide roost sites. Trees also add a third dimension to the landscape. This is vital to bats because the community comprises species adapted to hunting a variety of specific sites in and around the canopy.

It is also important to keep the understorey, and even vegetation where there are no trees, as diverse as possible. Diversity will add to the complexity of the habitat structure available to bats allowing 'room' for more species to occupy their specialized habitat niche. It will also ensure that there are ample shelters for the species that do not use hollow branches.

Bats have one great advantage over terrestrial mammals. They can fly. This means that they can travel quite long distances and many of them can cross quite big gaps between patches of habitat where there are essential resources. Thus bats can use areas of remnant vegetation much more successfully

than their terrestrial counterparts. A patch of timber may contain hollow branches from which a breeding colony of mastiff bats can forage over the surrounding countryside. Wattled bats, roosting in the old trees, may hunt insects over a nearby blue-gum plantation which is still too young to have developed any hollows (and, assuredly, will be harvested before it can do so!). Or a paperbark swamp may provide shelter for long-eared bats that hunt in an adjacent orchard.

Patches of remnant vegetation are important but so too are corridors. There are corridors along roads. They tend to traverse the landscape and so carry ever changing vegetation; swampy hollows, timbered valleys, heath on the ridges, and so on. Thus they provide a selection of roost sites and foraging habitats as well as a passageway between blocks of remnant vegetation. There are also corridors along creeks. While they may not intersect the same array of habitats, they often cross other corridors, adding to the network that bats can use.

Planning to manage land for wildlife can be rewarding. More importantly, it can benefit our need to keep our landscape habitable and productive. Bats are often the forgotten mammals, but they play a very important role in keeping nature in balance because they are predators of nocturnal insects. Their mobility is an advantage, making it easier to provide for them, but we must remember their requirements. If there is one word that sums up managing habitat for bats, it is "complexity" of habitat.

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References

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