

## The Maori Rat

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PRIOR to the coming of the white man to New Zealand there were only two land mammals in the country—the Maori dog and the Maori rat. As an ornithologist I have frequently tried to find out to what extent these animals affected the birds, but with little success—if there are any writings on the subject I have not seen them. Of the dog's hunting of the ground-birds there seems to be no record, though one is justified in assuming that birds formed part of the dog's food supply. A paper in the *Transaction of the N.Z. Institute* which gives an account of the damage done to flocks of sheep by wild Maori dogs clearly indicates that these animals were ferocious and cunning hunters, so that the comparative immunity of the ground-birds—weka, kiwi and kakapo—is the more inexplicable. The two latter might have been to some extent saved by living in dense bush, but one would have expected the weka, especially on the open plains, to have fallen an easy prey and to have become very quickly reduced in numbers.

The Maori dog has now been extinct for many years and opportunity for its ecological study is gone. The rat, though extinct, or nearly so, on the mainland, still exists in numbers on some of the outlying islands to which it was probably taken by the Maoris as an article of food. It is closely related to the imported black rat, but there are certain well-defined differences in appearance and a very marked difference in many of its habits.

Of the various writings I have seen on the native rat none refers particularly to the damage done by it to birds. Twenty-four years ago when I was camped on Taranga Island (on East Coast, 80 miles north of Auckland) rats came into my tent at night and ate some of my bread and stores, and although I did not catch any of them, I saw them once or twice and suspected that they were native rats. Since then I have often wondered why many of our birds, which are interfered with to a considerable extent by the introduced rats (both black and Norwegian) had so successfully survived in competition with the native species. It was certainly not because the indigenous rat was not sufficiently numerous, for there are records of veritable plagues of these animals, vast hordes of them at times travelling from one district to another. These movements were periodical, and to some extent resembled the famous migrations of the lemmings in Norway, though the rats did not go down to the sea, but died in great numbers in their new district.

In November and December of last year I spent six weeks on Taranga Island and had an opportunity of noting something of the relations existing between the native rat and the native birds. Our camping site was among tall manuka (*Leptospermum ericoides*), and in the late afternoon I saw a tui go to its nest in a neighbouring bush and feed its young. I looked into the nest and found it

contained one half-grown young bird and an addled egg. The noise we made erecting our camp evidently caused the tuis to desert their nest, for I did not see them return to it again, and at sunset the young bird was getting cold. Although we kept away from the vicinity of the nest for the remainder of the day I do not think the parents returned to it, and next morning the egg had gone and the young bird was eaten in the nest, only its legs, bill and wing-tips remaining. The next night some of our bread was eaten, and a night later I trapped a rat which was definitely identifiable as the native rat (cf. *Trans. N.Z. Inst.*, vol. 17, pp. 199-207, 1885). Major Wilson had brought two volumes of the Transactions with him, one of them (*Trans. N.Z. Inst.*, vol. 17, pp. 199-207, 1885) containing a description of the native rat, from which we were able to identify our captive as this species. Accordingly we killed the animal and preserved it in spirits. The readily apparent differences between it and the introduced species are as follows:—It is smaller than either of them and browner in its colouring than the Norwegian rat, while its hair is not so long nor so glossy as that of the black rat, and its eyes are rather smaller and more prominent than in either of the others. The most marked difference, however, is in its demeanour, which is much more placid. When either of the others would have been running around in the cage and biting the wire in an effort to escape, the Maori rat would sit quietly in one corner, behaving much as though it was accustomed to captivity and had been tamed.

Altogether we caught eleven rats in our tent; of these one was half grown and there was only one doe, a numerical relationship of the sexes which coincides with that which used to exist on the mainland, where bucks always greatly outnumbered the does. Strangely enough we never caught a rat in our tin trap when we set it out in the bush; the bait was never touched, although we set the trap where I had previously left for two nights a stale loaf of bread, of which more than half had been eaten. Bread was the best bait, but we caught them also by using tinned tongue. The bodies of petrels which I had skinned and buried in the ground some distance from the camp were exhumed by rats and eaten. The rats were remarkably lacking in enterprise as to gnawing their way into a receptacle to get food; they would not gnaw through a cardboard box, nor even through a paper bag, though they did gnaw through the mosquito netting of our safe and eat the head of a petrel that was in it. Thereafter I hung the safe from a branch by a short wire, and nothing was disturbed in it, although black rats would readily have jumped to and from the safe had they been there. It is possible that the sense of smell of the native species is not so keenly developed as is that of the introduced rat, and that they did not realise food was in the cardboard box and the paper bag; on the other hand, they could see and smell the bird in the safe. They ate fish when it was left about, taking the eyes first, as either of the other rats would. They were strictly nocturnal in their habits, and I saw but three in the bush during the day, and all of these I flushed when looking for birds' nests. There were quantities of kei-kei (*Astelia*) on the island, growing in great clumps

up the larger trees or completely covering the upper surfaces of large detached rocks, and this formed the chief home of the rats, being absolutely honeycombed with their runways and burrows. In it they had shallow nests composed of bits of dry leaf-sheath, in which they apparently rested. It is noteworthy that these nests rarely contained any rat-droppings, as do similar holes of black rats; nor did I ever find one to which the rats had carried stores of food, such as seeds; nor does the native rat use birds' nests for store and eating places as the black rat does.

At night when out with our torches in the bush looking for petrels we frequently saw rats but always on the ground, where their movements are not nearly so swift as those of the imported species. We never saw one up a tree, although we had abundant evidence that they are expert climbers. In this respect they resemble the black rat, though the latter is a much more active animal.

So far as we could ascertain the chief food of the rats on Taranga consists of berries of different sorts, of which there is an abundant supply, and we often saw half-eaten seeds of tawa, taraire and puriri lying about on the ground; but in addition to this they would eat any dead animal-matter they came across. Finding the clumps of kei-kei in the trees so infested with rats I concluded that it was not worth while searching for saddlebacks' nests in them, but this conclusion was wrong, for I later found these birds nesting and roosting in clumps of kei-kei which had quite recently been tenanted by rats, and almost certainly were still. I found many tuis' nests, deserted on account of heavy rain, in which the eggs had not been touched; also three saddlebacks' nests each containing one unincubated egg, two of them deserted for at least a week, and the third for over three weeks, and yet the eggs had not been touched by rats. This is a state of affairs very different from that on the mainland, where the eggs would probably have been taken before the bird deserted, or very shortly afterwards. No doubt the rats on Taranga occasionally destroy saddlebacks' nests, as is indicated by the following note from my diary of 22/11/33, which refers to a saddleback's nest in a hole in a puriri:—"The nest was this year's and in the middle of it the lining was bound together by broken egg, and this part contained a number of small black feathers, apparently from the saddleback's breast. There were three fair-sized bits of eggshell in the nest. . . . I suspect rats of the damage, but have no proof." I found bell-birds' nests with deserted eggs intact, and others deserted with eggs smashed, and a nest with the remains of eaten young in it, though whether the rats were responsible for the killing of the young I could not say. Fantails, tomtits, blightbirds and warblers, though present on the island, were comparatively scarce. A fantail near our camp reared a brood of four young while we were there, and her empty nest from which a previous brood had flown was in another tree nearby; also a brood of blightbirds was brought off close by our camp, although rats were numerous there. On the other hand, I found three tomtits' nests deserted and empty from which no brood had been reared. These, however, were all in cavities in the boles of big trees, and it is quite possible that long-toed lizards had robbed them. Against

this suggestion, however, is the fact that I found a red-headed parrakeet's nest in the bottom of a hollow in a pohutukawa and a long-toed lizard in the top of the same hollow. In clumps of kei-kei I found several deserted blackbirds' nests in which no broods had been reared, a fact certainly suggestive of the activity of rats.

During our stay on the island we found a number of petrels' eggs lying on the surface of the ground, and with one exception they had been eaten by rats; but there is no reason to believe that these eggs had not been laid on the ground-surface by the birds, for there was no evidence that they had been removed from burrows. I found one young fluttering shearwater at the entrance to a burrow, partly eaten, apparently by rats. Perhaps the most remarkable feature of the case is the fact that the native rat does little or no damage to young petrels. When first hatched these birds are helpless, and fall a very easy prey to any animal that cares to go into the burrows after them. The extent to which the imported rats kill young petrels is well exemplified on the mutton-bird islands off Stewart Island where these rodents have in some instances almost exterminated the mutton-birds. On another occasion I discovered three broken eggs of Pycroft's petrel in the bottom of a big hollow stump and this was the only instance we came across of rats having gathered a food supply together to eat it. Of the red-headed parrakeets' and kakas' nests we found none had been disturbed by rats, and in one parrakeet's nest was an addled egg that had been in the hollow tree since the previous nesting season.

From the foregoing it will be seen that the native rat does very little damage to the indigeneous bird life. If a tui's eggs were removed from a deserted nest and placed on the ground rats would eat them, but in the nest the eggs were rarely interfered with. On the other hand moreporks were extremely numerous on the island, and I do not doubt that their large numbers were due to the abundant food supply available in the form of rats. I found half-eaten rats in moreporks' nests with the young birds, and a note from my diary reads, "Under the roosting-branch of a morepork which was beautifully sheltered by palm-leaves I found pellets composed entirely of rat fur." The moreporks' nests contained as well as rat-remains feathers of different birds that had been used to feed the young, and I think it at least as likely that the scarcity of the warblers, tomtits, fantails and waxeyes can be properly attributed to the moreporks as to the rats.

The position in regard to Taranga Island may be summed up as follows:—Native rats are numerous. All over the island we found abundant evidence of their presence. At the same time the island has a very dense bird population on which the rats have very little effect, save in the case of the morepork, for which they form a delectable food supply. Closely allied as is the native rat to the introduced black rat, the difference in some of their habits, and particularly in their relationship to birds, is very remarkable indeed.