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THE KOKAKO (*Callaeas cinerea wilsoni*) IN THE HUNUA RANGES

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ABSTRACT

The history of the Kokako in the Hunua Ranges and contiguous districts is given so far as it is known. No literature prior to 1943 has been found for this area. J. W. St Paul's sixty-five years experience of this bird, and, latterly, his work and that of others have proved that there has been a very serious decline in the population. Although seven nests were found between 1943 and 1953 only one, in 1962, was found in the nineteen years from 1953 to 1972, this in spite of intensive search in the later years. Fears for the future are entertained because exhaustive nest hunting efforts have failed for so long.

Feeding is discussed, also the variation in songs and calls from those of further south. Of predators present *Rattus rattus* and the Myna (*Acridotheres tristis*) are considered to be by far the most destructive agents and could well cause the extinction of the species here and elsewhere.

Even if this bird does die out in the Hunua Ranges all this effort will at least have compiled much information and a certain amount of history.

INTRODUCTION

This account of a local population of Kokako (*Callaeas cinerea wilsoni*) is meant to cover its history, to supplement previous writings, to record recent investigations and to discuss its decline. The Maori

name Kokako is used in preference to the name "Blue-wattled Crow" because the bird has no affinity whatever with the crow (Corvidae), but belongs to the wattle-birds (Callaeidae). Buller (1888: 1, pl. I) gave a comprehensive account of the species (see also Turbott, 1967: 3-6, pl. 1) and M'Lean (1912: 229), graphically described the habits and calls of a local group in the Gisborne district in 1906 and 1907. Sundry further notes published in *Notornis* are mentioned herein (see also J. W. St Paul 1958, 1959; J. W. St Paul & Maning 1960; Macdonald 1966).

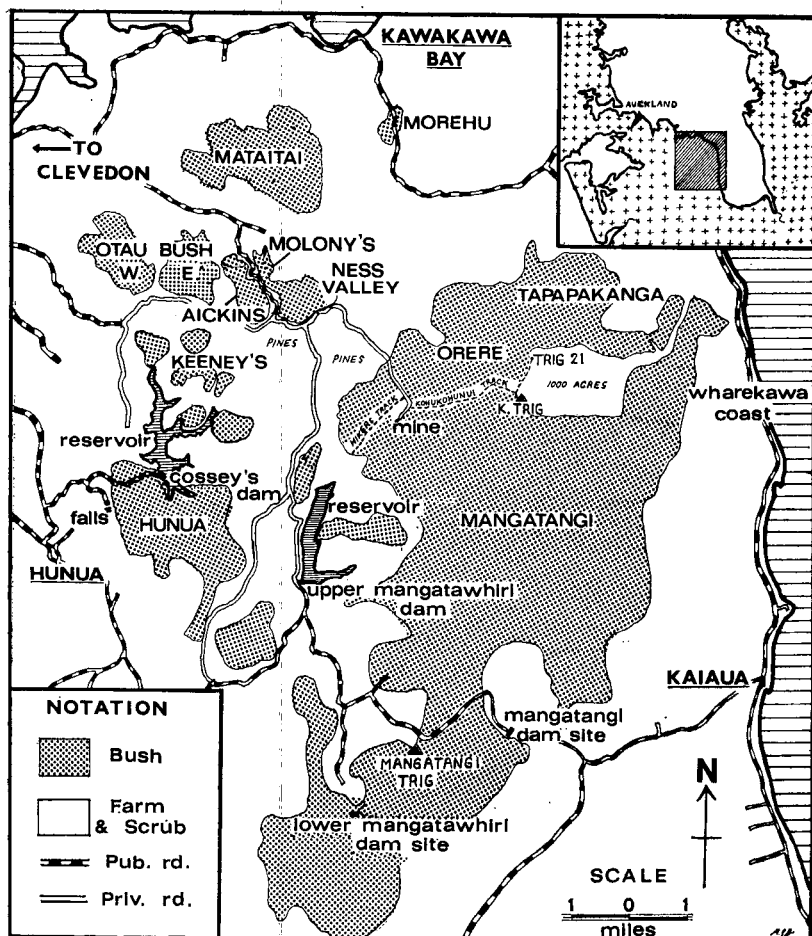


FIGURE 1 — Study area of Kokako in the Hunua Range.

del.: M. E. Douglas

GEOGRAPHICAL

The name "Hunua Ranges" is a term loosely applied to the jumble of minor ranges, with steep ridges, narrow valleys, deep gullies and rough plateaux, widely encircled by Hunua, the ill-defined Otau area east of Clevedon, Ness Valley, Orere, the Wharekawa coast, Kaiaua, Mangatangi, Mangatawhiri and Paparimu towards Hunua. The first map shows the relationships of the areas and places mentioned (Fig. 1).

The naming of these areas within these boundaries is also indefinite. Cossey's Dam (Reservoir) reached via Hunua could be said to be in Hunua or else in Otau. The Upper Mangatawhiri Dam (Reservoir), reached from Hunua, then Paparimu, then by Moumoukai Road, is in the Moumoukai Valley, while the rough high plateau north-west of it is also called Moumoukai. On the west side of the plateau, where Otau impinges on it, farms were bought by the Auckland City Council (later replaced by the Auckland Regional Authority) for the purpose of water catchment, allowed to go back into fern and early bush regeneration, then largely cleared and some hundreds of acres planted in *Pinus radiata*.

The highest feature of the area is Mt Kohukohunui, 2256 feet, best reached from Clevedon via Ness Valley, Moumoukai Hill Road and a private road (Plows' Road), skirting the northern edge of the plateau, then through solid bush on G. M. Maning's manganese mine road to the gate of the mine claim. Here a car is left and a foot track goes east for two and a half miles (4 km) along the top of a high ridge to Mt Kohukohunui and another half mile (800 m) to Trig 21.

On the left of this track is the Orere basin of bush and the reverting "Thousand Acre Clearing" is to the right. Near the summit of Mt Kohukohunui are the sources of the Mangatawhiri River, the Konini Creek and the Mangatangi River, the latter first tending east, then south, partly parallel with the Mangatawhiri. The lower part of the Mangatangi, where a further reservoir will be established, is approached by private road from the Kaiaua-Mangatangi Road. All of this northern, central, eastern and southern area, excepting the Hunua part, is in the main block, with at present two artificial lakes, and is intersected by private roads and a small proportion of cleared land. The pine plantation is on the western side of the bush. Access by these private roads has to be obtained through the Auckland Regional Authority officer in charge.

There are approximately 30,000 acres (12,144 ha) of bush in this main block, most of which is habitable for the Kokako. Some areas of Hard Beech (*Nothofagus truncata*) in the north and east, together with Kauri (*Agathis australis*) and Tanekaha (*Phyllocladus trichomanoides*) which occur more in the east and south, though used, were never so much favoured as the greater area of more mixed bush, with plentiful Tawa (*Beilschmiedia tawa*), all of which held a strong

population in the early days. This choice of habitat still holds good today in regard to the present scanty remnant of the species.

Outside this area are several smaller blocks totalling c6050 acres (2610 ha).

Otau Bush. This, c1050 acres (404.8 ha), in two parts, is on the western slope, some of it sufficiently unspoiled to hold Kokako but most of it heavily browsed and wrecked by timber getting. It lies partly in Otau and partly in Ness Valley and is known to have once held many Kokako. One was seen at the north-western lower corner about 1940 and another at the south-eastern edge on 1 November 1966. This bush has only once lately been checked, but without success, on 12 August 1973 by the King's College Bird Club (KCBC) and it is just possible that it could still hold a very small number of Kokako.

Aickin's Block (really a fraction of the actual survey block), c400 acres (c162 ha) on the south-west side of the Moumoukai Hill Road, is a rough steep narrow valley draining from the Otau Range into Ness Valley. The bush is moderately intact. Mr T. Murray of Clevedon, when a schoolboy, c63 years ago, used to stay and work at times on a back farm at the top edge of this block and he well remembers how in the early mornings the whole valley rang with the song of the Kokako and Tui. Only an occasional Tui is to be heard there now.

Molony's Bush. This 50 acres (20.24 ha) or so is on the north-east side of the Moumoukai Hill Road and is in Ness Valley. In the early sixties it had three Kokako, but lately only one. This one, seen in 1961 by J.W.StP. to have a short tail, was apparently a young one, then with its parents, the latter having since disappeared. One seen there alone on 28 May 1971 is thought likely to have been this bird.

Ness Valley Bush, a headwaters basin, c600 acres (c243 ha), divided only by a fenceline from Molony's, is all of excellent Kokako bush. In 1962 J.W.StP. heard from the ranger's house at the top of the Moumoukai Hill Road six callings at once from this basin and the adjoining Molony's Bush, which could indicate six pairs. None had been heard in the Ness Valley bush block since 24 April 1968 until the KCBC, on a survey, got a call in the north-eastern corner in 11 March 1973. This one however may have been the one from Molony's Bush. A St Paul family survey party had got nothing on 21 February 1971. This sudden drop may be attributable to the felling of an adjoining 150 or so acres of bush on the north side of the 600 acres, including a favoured main ridge. Smoke from the burning of the felled bush may have been a factor as was certainly the case with the birds in the great Raetihi fires of long ago.

Mataitai Block, lying north of Ness Valley, c900 acres (c364 ha) is partly of suitable bush. About twenty years ago two Kokako were shot there but thorough searches by J.W.StP. revealed none in 1970-71. *Cashmore's Hill* or the *Morehu Reserve*, c100 acres (40.48 ha), is

reached shortly after leaving Kawakawa Bay on the way to Orere. Although it has a little good mixed bush it is largely Kauri-Hard Beech association, running into Manuka (*Leptospermum scoparium*) on the ridge tops. Even in the early days it would have held few or no Kokako.

Keeney's Bush, of c400 acres (162 ha), consisting of several patches more or less joined together by secondary growth, is all about the north-eastern area of Cossey's Dam. It held Kokako up to 1957 so still may have some, but none has been seen or heard lately by rangers working there.

Hunua Bush, c2500 acres (1012 ha), extends to the south and east from Cossey's Dam and is known to have once been well populated. The bush is still very suitable for the species. About ten years ago one bird was seen by a casual visitor. A recent search by two competent observers who camped out in the bush and searched 12 or so miles of bush foot tracks and ridge tops was not successful.

HISTORY OF INVESTIGATIONS & NEST HUNTING

J. W. St Paul came to the Moumoukai Valley in 1901 at the age of four years. He remembers throwing clods at Kokako on his way through the bush to school. In those early days he knew this bird to be almost as plentiful as the New Zealand Pigeon (*Hemiphaga novaeseelandiae*). As the pigeon could then be shot by the sackful this indicates the former abundance of the Kokako and emphasises the fact that we now have only a pitiful remnant. It was not shot as it was not palatable. From 1905 to 1963 J.W.StP. lived and worked in and about the bush, except for his war service in World War 1, taking a lively interest in the birds and the trees. After the war he had a farm which ran back into the bush. Calls and song were readily and frequently heard by him and his wife and family from their house. His wife had lived on a nearby farm and knew the birds well. The Kiripaka Stream runs through this part of the bush. Only one has been heard there lately.

From 1941 a more intensive study of the principal area, as shown on the second map (Fig. 2), was started and H.R.McK. was guided by J.W.StP. to a closely heard Kokako, his first hearing of the bird, on the Mine Road. (The Mine Road is the section from the edge of the bush to the claim gate). On 20 December 1941 R. B. Sibson and H.R.McK. camped on the manganese mine road (the Maning's Road section of it) and very early on the 21st saw their first pair of Kokako in some large Tawa. In the ensuing years many others took part in the study.

The finding of nests is far from being easy. Any success has been achieved by much hard work and sometimes by good luck when parties or persons were just looking for birds, though they were always on the lookout for nests too. The numbers used below as headings for each nest found are shown on the accompanying map.

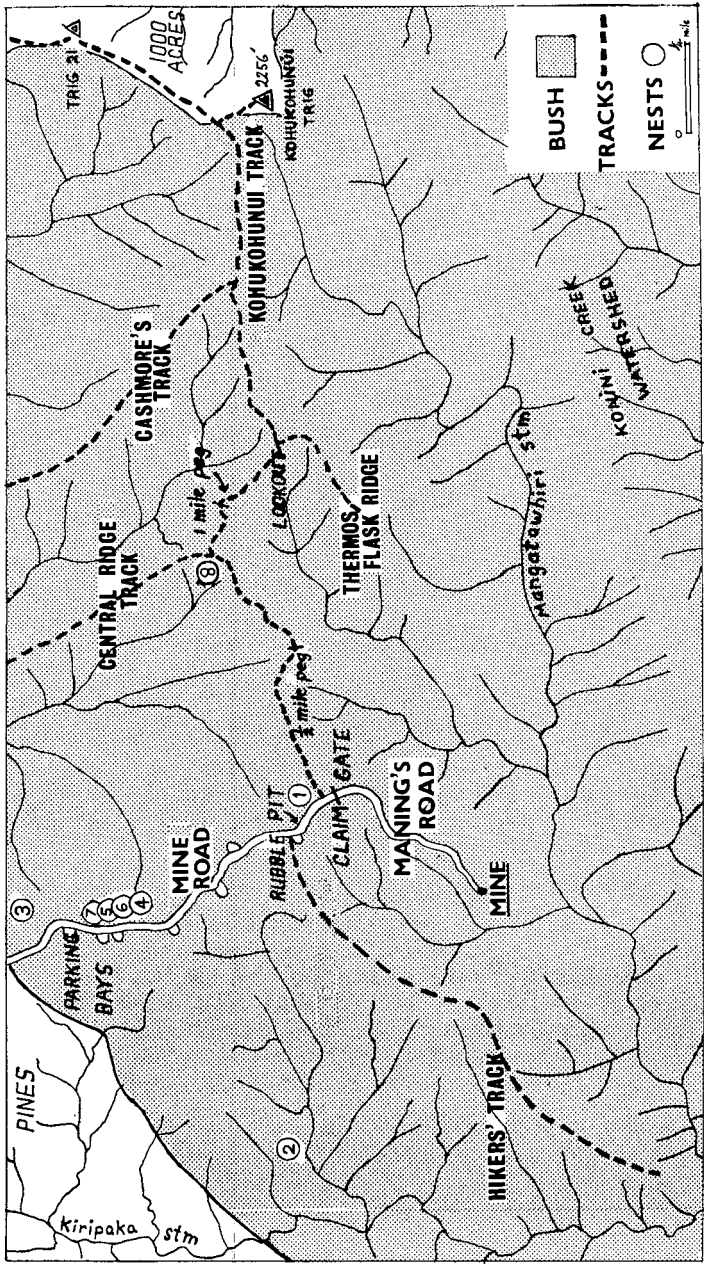


FIGURE 2 — Detail of nest localities of Kokako in Hunua Ranges.
del.: M, E, Douglas

Nest No. 1, (H.R.McK.), 28 November 1943, was 17 feet (5.18 m) up in a Toro (*Myrsine salicina*) in the corner made by the junction of Mine Road and the Kohukohunui Track. It was filled loosely to the brim with dead leaves so evidently was of the previous season. In the bottom of it were fragments of eggshell, which, flattened out were up to 2 cm across. The colour was retained. Predation by a rat seemed most likely, the nest being above a large log where rats would live. The nest had kept its full shape and is now in the Auckland War Memorial Museum (McKenzie 1944).

Nest No. 2, (J.W.StP.), 26 December 1943, was 35 feet (10.6 m) up in an unclimbable Tawa sapling, with parents feeding young. On 5 & 8 January 1944 the parents were about but on the 9th were absent. A bush ladder was made and R. B. Sibson used it to scramble into another tree whence he was able to see that the nest was empty. Below the nest, caught up in twigs, was the dried form of a full sized but not fully fledged young bird. The assumption was that it had been moving about the tree, as they do for several days before leaving completely, that it had died by accident and that the others had left naturally. The dried specimen is in the Auckland War Memorial Museum (McKenzie 1944).

Nest No. 3, (H.R.McK.), 27 November 1949, perhaps 5 of 6 years old, was found on a special nest hunt, c27 feet up in a Toro. It was definitely, by its structure and position, not a pigeon's nest (unpubl.).

Nest No. 4, (R. H. D. Stidolph, J.W.StP. and H.R.McK.), 3 November 1950, was about 40 feet up in a straight Tawa. It was proved to be a "play nest" when on 8 December 1950 D. A. Urquhart made a hazardous and skilful climb and examined it closely. It was only a flat platform and was not concealed (McKenzie 1951: 71).

Nest No. 5, (F. J. Lownsbrough, Rev. R. J. Fenton, F. G. Milner, T. F. Murray and H.R.McK.), 2 December 1956, was in a Tawa at 26 feet, in a dense clump of reversionary branches on an old trunk. T.F.M. tied a rope across his ankles, scaled the tree and found three tiny chicks being brooded in a nest. These were watched until they were seen by J.W., R. and R. B. St Paul to finally go away on 27 December 1950. A full account was written (McKenzie 1951: 70-76).

Nest No. 6, (J. D. Mitchell, F.G.M. and H.R.McK.), 6 December 1952, was being built by two birds in a precarious position. One side of the nest rested against, not in or on, a clump of astelia and the other on an unstable reversionary Tawa branch. On 11 December 1952 T.F.M. climbed up and found three eggs. The nest could never have held three large chicks and a parent so a wire was fixed across under it to take the weight. The tree could not be isolated by tinning as had been done with No. 5 so it was decided to leave it alone so that vermin would not be attracted by our visiting it. However the birds must have sensed its instability and deserted. On 26 December 1952 Rev. R.J.F. found the nest empty. The three deep indentations in

the nest lining indicated that the nest had been deserted long before the eggs were taken by some predator (McKenzie 1953: 174).

Nest No. 7, (Rev. R. J. Fenton), 16 November 1953, was in a Toro c60 yards (55 m) west of the nest of 2 December 1950. It was old and unfinished and in a difficult tree so no effort was made to climb to it (unpubl.).

Nest No. 8, (J. W. and R. St Paul), 1 January 1962, was in the early stages of building. The site was about 25 feet up in a mass of rata vine (*Metrosideros fulgens*) on a Raukawa (*Pseudopanax edgerleyi*). Visited last on 31 January 1962, eggshells on the ground indicated very recent hatching and that the young had been taken on the night of 30 January 1962. Although the tree fell down two years later the nest was still recognisable as such eight years after it was built (R. St Paul 1963: 180).

Nest hunting has been diligently pursued from 1943 to 1973 so the total of eight nests shows the difficulty of finding them. From October 1971 to November 1973 specially planned efforts by many more observers have failed to find any at all. It is really alarming that no nest has been found in the last ten years and only one in the last nineteen years. Strangely enough for a bird of such weak flight ridges are preferred for nesting in the Hunuwas. It seems odd to see the birds labouring up through the trees on a very steep slope to the top with a beakful of material and also when bringing food to the young. Bearing this habit in mind main and side ridges were plotted and allotted to teams for special searching. Not even an old nest was found and as already noted they last for several years.

The searchers were briefed in the call of the young, which is made after they have left the nest, an unmusical short "Kwok-kwok," but none was heard. This call, which somewhat resembles the short concluding notes of a frog in song, was described by Mr Robert Quinn to H.R.McK. on 2 January 1944. Mr Quinn had been brought up among Kokako at Patumahoe and knew the species thoroughly. The next day H.R.McK. and others heard the call near the western end of the Kohukohunui Track. The bird followed the party a little way through the high trees but could not be sighted. Fledglings, perhaps a little older, found by J.W.StP., have made calls like some of the shorter ones of the adult. C. R. Veitch, of the Wildlife Service of the Internal Affairs Department, has told H.R.McK. of hearing in the King Country on 17 August 1971 the awkward attempts of a young bird learning to sing.

Young birds have been seen after fledging by J.W.StP. as follows: 24 January 1943, one seen at six feet, fully grown, but not fully feathered, alone (J. W. St Paul 1943: 29).

21 February 1945, two adults feeding two young two-thirds grown and tails only half length, as were those of No. 5 Nest when they left (J. W. St Paul 1946: 136).

1961, the one in Molony's Bush already mentioned, tail three quarters grown. (J.W.StP.)

CALLS

The differences in the calls of the Kokako of the Hunua Ranges from those of further south are quite remarkable. Taped calls of those Kokako near Rotorua and in the King Country illustrate this. However these tapings were made in recent years and songs and calls can well have changed there as they have done here. What we call the "full song" here, two long organ notes, followed by three sharp "pipes," was very common until the last few years, but has, to the best of our knowledge, completely faded out. We have no evidence of this call having been heard further south. The unwary may take it for Tui, but it is never quite the same, though some Tui notes do closely resemble other calls of the Kokako. M'Lean (1912: 229) listed calls in the Gisborne bush in 1906-1907 but the "organ and pipe" was not included. Other calls in the Hunuas are described by Maning (1960: 7-8).

Some years ago there was much argument in the press about the "cowbell" call, common in the King Country, some of the old settlers and bushmen claiming that this made the Kokako the "true bellbird," while the Bellbird of the ornithologists (*Anthornis melanura*) was, according to them, the "mockymock," a corruption of one of the Maori names, Makomako. To our knowledge this "cowbell" call has not been reported lately in the south. It certainly has not been taped. In the Hunuas J.W.StP. knew it from 1905 to 1914, but not since. Neither was it as common here then as it apparently was in the King Country.

Another significant point is that while the Wildlife Service has had considerable success further south in attracting birds by playing taped calls it is seldom that notice is taken here of either the southern taped calls or of their own. M. E. Douglas taped a bird in sight in a tree a few feet above him, then played its calls back to it without its showing any interest at all nor did the playing of the calls attract birds further along the track. They do respond at times but not nearly to the extent that the southern ones do. In the Hunuas no seasonal variation of song has been noticed except in volume. Much remains to be learned of the vocal characteristics of this bird. For instance although a courtship dance has been described (Buller 1888) J.W.StP. has never seen it here, nor has he ever heard a song or call that he could ascribe to courtship.

DECLINE OF KOKAKO POPULATION

The decline of this population, which is now an isolated remnant, is a matter for concern. No-one now alive can remember the forests in the lower country here in their virgin state but enough is known to be sure that they supported a healthy population of the Kokako, New Zealand Pigeon, Kaka (*Nestor meridionalis*) and Red-crowned Parakeet (*Cyanoramphus novaezelandiae*). This would apply not only

to the rich lower lands of Clevedon but also to Papakura, Pukekohe, Patumahoe, Waiuku and adjacent areas. As late as the early 1940s, R. B. Sibson (pers. comm.) had a reliable report of five Kokako seen at once in a small area of bush at Patumahoe. Mr R. Quinn told H.R.McK. of their abundance there in his young days, when nests were often found, especially in Ramarama (*Lophomyrtus bullata*), usually with three eggs, one of which would sometimes fail to hatch. The late H. S. Munro, a prominent amateur naturalist of Clevedon, has told H.R.McK. of its being common in what was left of the Clevedon lower bush in his time. He was called to a nest in a tree which grew only a few feet above the high tide mark in a creek. The nest was seen when the tree had been felled. One chick had hatched and he had great difficulty in getting the large chicks out of the other two eggs, one of which, dated 22 November 1887, is in the Auckland War Memorial Museum.

Shortage of food is certainly not a factor in the decline of the Kokako here. The account of J. W. St Paul (1966: 99) shows that the diet is not highly specialised. The bush provides an abundance of the foods listed, enough to support many times the present number of birds, but if this bush were in its virgin state it would support a great many more. I. L. Barton, Forester, Auckland Regional Authority, Hunua, describes the present state of the bush (Barton 1973). He discusses its deterioration during the last hundred years owing to the destruction by browsing, not only to the shrubs of the undergrowth but also to the seedlings and saplings of the larger trees, so that there is now a gap between the old and the young, the mature trees dying out while the young ones, until lately, have been largely prevented from replacing them.

The early settlers wintered cattle in the bush. Some went wild and the last were shot out before 1914. Goats then became a serious menace and, though greatly reduced, are still giving trouble. Pigs and opossums are hunted assiduously. The young growth is now improving but it will take very much more than a hundred years to fill the gap between the young and the old. The Kokako should certainly survive this period of forest transition, provided it is not annihilated by predators.

The Kokako is now rarely seen on the ground. H.R.McK. has seen it only once when one hopped across a bush road. J.W.StP. used to see it quite often on the ground but not after the advent of the stoat, about 1914. He holds the theory that Kokako which used the ground were wiped out and those more arboreally inclined survived. M'Lean (1912: 229), in the Gisborne bush, found them using the ground frequently, apparently getting fallen berries or insects. He also watched them seeking insects in the bark of trees and in moss. We have never known them to look for insects and odd probings in moss were thought perhaps to be for moisture. Certainly they sought there the tender ends of polypodium rhizome.

It is notable (St Paul 1966: 99) that Tawa is a sign of good habitat, even though it provides only one of the main foods, but any well mixed bush is suitable. The writers have proved that they can recognise good Kokako bush from over a mile away.

The reduction in numbers is firmly believed by the writers to be almost entirely due to predators, the chief being the ship rat (*Rattus rattus*), sometimes called "roof rat" or "black rat" (the latter here being of the light phase only) and in this bush could well be called the "tree rat." One winter we trapped 24 of these rats in about 2 acres (.88 ha). Another time traps set near a nest caught a stoat, a ship rat and a mouse in only a short time. We have of course only a little definite evidence of rat predation of the Kokako but it is backed up by its known destructiveness to other species in that bush. Another major predator is the Myna (*Acridotheres tristis*) which now penetrates the heavy bush and actually lives in it wherever a road or even a tractor track runs through it. J.W.StP., in the Mataitai Block, found eggs of Pigeon and Tui on such a track where the mynas had taken them to eat their contents. Rats or stoats eat eggs in the nest or take them under cover. This is a serious menace to all of our arboreal native birds. Stoats and cats are present in very small numbers. The gentle Kokako is no match for introduced vermin and we fear that few, if any, are able to breed successfully here.

In 1957 J.W.StP. estimated the population of the main block of 30,000 acres (12144 ha) to be 250 to 300 birds, but c50 in 1967. The more intensive work of 1971-72 by a greatly increased number of searchers revealed a total of perhaps 60 to 70 birds. It would therefore appear that the 1957 and 1967 estimates, not having the advantage of intensive search by so many people, were too low and that the 1957 estimate should perhaps have been 500. In either case however the rate of decrease would be serious. The making of an estimate in this main 30,000 acres is very difficult but a decline is only too obvious. A marked decline has been reported around Rotorua. Other areas further south have not been reported upon until recent years so the former status is not recorded for them.

In February 1971 John A. and Beth Brown of Papakura suggested a sustained effort to study the Kokako of the Hunuas and they led some of the parties which were arranged. Because calls begin at sunrise (seldom at dawn) and usually continue at peak to 9 or 9.30 a.m. it is necessary in summer to camp up near the bush and be on station early. Calls during the day are infrequent and an increase in the evening is too slight to be of use. From February 1971 to August 1973 there have been five campouts of 8 to 11 watchers, one by Miss A. J. Goodwin alone and two by KCBC. J.W.StP. has camped alone eight times for up to three days on Mine Road and once at Kohukohunui Trig. Ten day trips have been organised, six of these by KCBC. One of the camps was at Orere for working the Tapapakanga basin on 4 April 1971. Most one-day trips were made

on the shorter days when the sun rose later, some to Kohukohunui Track, Mine Road, Maning's Road, the Hikers' Track, Ness Valley and Orere basin. For the 24 April 1971 Orere trip Mrs Glenis Martin drove alone from Whenuapai, Simon Chamberlain from Whangaparaoa, Dr Ian Malcolm from Murray's Bay, Murray Douglas from beyond Waiuku and Auckland members arrived at Clevedon at 5 a.m. to go 14 miles from there to the bush. This surely illustrates the calibre of the Kokako seekers, while from February 1972 the boys of the King's College Bird Club, aided by masters supplying transport, have capably joined in the scheme, making many trips. Altogether 61 persons have taken part in these more recent researches, many of them several times.

Many visits are needed to arrive at something like a true count. The behaviour is so unpredictable that no two accounts are likely to be the same. Sometimes no Kokako at all will be seen or heard even in the best areas. This obtained too when the species was far more numerous than it is now. Estimates for the places worked have been arrived at by taking the number of birds heard, doubling it to allow single calls to represent pairs, then deducting one in each six or so to allow for single birds, then adding birds seen. Calls of birds seen are of course not counted. Pairs are much more common than singles. In some cases allowance has to be made for overlap of the areas of two teams getting the same call. On this basis the highest estimate of birds for a trip was 34, on 14 March 1971; 25 on the Kohukohunui Track, 4 on Mine Road, 5 on the Hikers' Track and none on Maning's Road or at the mine.

The Kohukohunui Track area seems to be the most favoured centre at all times of the year, though the birds are spread over several miles. No close flocks, large or small, have been seen. Study over the years 1971 to 1973 has been maintained by camp-outs and one-day trips. Counts for 1971 ranged from 1 to 25, the average for the six trips made being 11.8. For 1972 nine trips gave counts of 2 to 15, the average being 6.7. Nine trips in 1973 gave 4 to 25, averaging 10.6.

J.W.StP. camped at Mt Kohukohunui and from the Trig on 16 November 1973 heard 14 calls from separate places, representing perhaps 25 birds. Two calls were from near Trig 21 and the others in a wide arc to the east, south and south-west for up to one mile. Oddly they started at daylight and ceased at 6 a.m. None was heard on the Kohukohunui Track and Orere basin, neither then nor when he walked along the Track to Mine Road. Was this another loose concentration on the east of the usual area and if so why did it occur away from the usual territory at the time when breeding birds should have been feeding young? We do not consider that these had gathered from the whole block. This can never be checked owing to the impossibility of getting enough watchers to simultaneously cover the remote parts of this large tract of bush before sunrise on the one day.

Mine Road, once populous, is no longer so. J.W.StP., camping often on this road from 1971 to 1973, has found that two pairs at the northern end have gone and that the main nesting area and the bush west of this road now have only odd pairs or single birds occurring at times. Against this decline however is the fact that callings from three of their former positions still come from far down in Cashmore's, east of this road. Records have been 0 to 8, averaging 3.8.

The Hikers' Track has not received much attention, much of the bush being tree fern. Two calls of 1972 and 1973 heard west of the mine could have been from birds of this area, besides the estimate of 5 on 14 March 1971.

Maning's Road and the mine, once particularly populous, was frequently visited but produced nothing for these three years until 4 on 18 January 1973. Here also we have a calling persisting from far to the east of the mine.

The eastern part of the Orere basin (Cashmore's) is included in the Kohukohunui Track records, except that a special survey on 24 April 1971 gave a count of 7.

One camp-out for the Tapapakanga basin yielded 6. Conditions were perfect. One set of callings closely heard and timed by one party was also heard and timed by another party at a distance of a mile and a quarter by map.

Small lots are known on the east side of the upper Mangatawhiri Dam and in the vicinity of the Mangatangi Trig and there are scattered pairs elsewhere. Since the most favoured part of the block held about 34 for 1971 the total for the whole can hardly have been over 60 or 70.

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