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RECOMMENDATIONS FOR MANAGING NORTHLAND KOKAKO

(Short Answers in Conservation Science)

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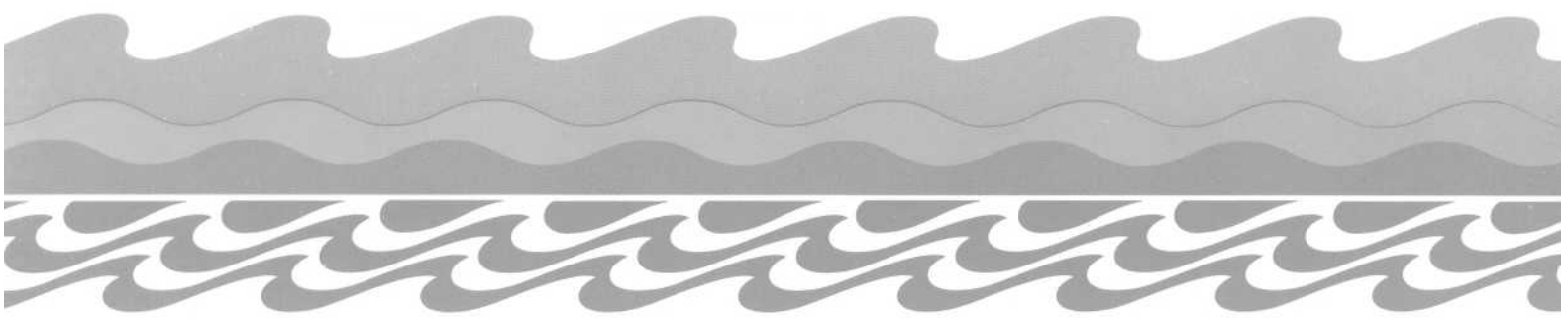

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RECOMMENDATIONS FOR MANAGING NORTHLAND KOKAKO

By N Miller

1.0 INTRODUCTION

The North Island kokako *(Callaeas cinerea wilsoni)* is the only member of the endemic family of New Zealand wattlebirds *Callaeidae* to have survived thus far on the New Zealand mainland. The other members of this ancient family are either restricted to offshore islands as is the case with the North and South Island saddleback, or extinct (huia). The South Island kokako may still survive in very small numbers but its future appears to be grim.

Kokako are generally sedentary and territorial throughout the year and may be relatively long lived at c. 20 years (Hay 1981). During early European settlement the North Island kokako was distributed as dense populations in scattered localities (Buller 1892), but since the turn of the century they have shown a marked reduction in range and numbers (Lavers 1978). This is largely attributed to the large scale felling of its forest habitat during this period but the species has continued to decline in forests which have not been logged for many years. Populations are now restricted mainly to the central North Island and Bay of Plenty forests but small isolated populations occur in the Hunua Range, Coromandel Range, on Great Barrier Island, in Taranaki/King Country, and in Northland (Rasch 1992).

Of these small isolated populations very few still appear to be sustainable in terms of known population trends or structure. Recent work suggests that both the Hunua population (numbering some 40 birds) and the Coromandel population (numbering less than a dozen) are extremely fragmented and have a low pair to single ratio. The Great Barrier population is possibly on the verge of extinction (Brown 1990) and Taranaki and the King Country (apart from the Cowan block and Mapara) are fragmented remnants now being recruited for Kapiti Island. South Waikato and northern King Country populations have suffered a 65% reduction in numbers over the ten year period prior to 1991. The Northland situation is similar. In the late 1970s and early 1980s Puketi supported 100 kokako representing the highest density of kokako known to exist. Recent surveys suggest that the population has crashed and as few as 6 pairs and 14 single birds may remain in Puketi (S McManus pers. comm.).

The critical state of these populations has been recognised by the kokako recovery group who plan to utilise "remnants" for stocking Kapiti Island (objective 3 in the North Island kokako recovery plan). Such a move is warranted as fragmented populations are very difficult to manage effectively and if remnant pairs (and some single birds) were not moved to an island sanctuary their genetic contribution would be lost forever.

The recent discovery of a large population in Te Urewera while appearing to relieve the urgent need for kokako management, only really restores total estimated numbers back to where they were 10 years ago (about 1500 nationally) and only slightly extends the geographic range of viable kokako populations. It is, however, interesting that these birds are in virgin forest, and the possum population has not yet peaked. Possums have recently been credited with the predation of a female kokako on the nest, and of kokako eggs.

As more information on the current status of regional kokako populations becomes available it is becoming plain that unless immediate action is taken the North Island kokako will soon become an offshore and central North Island phenomenon.

2.0 CURRENT STATUS OF KOKAKO IN NORTHLAND

2.1 Puketi

Only the populations of Puketi and Waipoua/Mataraua have been surveyed specifically for kokako. In 1984 Puketi contained 100 kokako of which at least 50 were unpaired. Best and Bellingham 1990 suggest that this pair/single ratio limits the breeding potential of the population- Studies in the central North Island indicate that such populations have a low annual production and that not all pairs attempt to breed every year (Hay 1981). However, juveniles were seen and a nest found during the 1984 study.

The most recent survey work in Puketi Forest suggests a dramatic decline in total numbers and a reduction in the ratio of pairs to singles. The 6 pairs located since 1989-90 are scattered over a large area with only one instance of 2 pairs being located within the same square kilometre (see map 1).

A comparison of 1984 data and post 1989 survey information, while not necessarily being an accurate calculation of population trends, indicates a dramatic decline in pair numbers. All 24 1984 pair territories have been revisited at some stage since 1989/90, and while the survey efforts are difficult to compare, results to date indicate a reduction in pair numbers of up to 75% in less than 10 years. The high percentage of territories now held by single birds is a further indication of a population in serious decline.

Concern was expressed at a meeting in late 1989 after initial survey results indicated a reduction in total numbers of up to 50%. Since then some possum and rat control has occurred centred on a "core area" containing 3 pairs in 1990. (In 1992 only 1 of these pairs was able to be reconfirmed.) An aerial 1080 operation has also been undertaken over the entire Puketi Forest in March 1992.

2.2 Waipoua/Mataraua

At least 15 birds (including 5 pairs) are concentrated at 600 m a.s.l. in diverse podocarp broadleaf and towai dominant forest with a 3000 mm mean annual rainfall (Pierce and Montgomery 1992). Parts of the area were farmed up until 1930 but have regenerated into uniform towai dominant forest. The majority of territories are within the more diverse podocarp broadleaf forest.

Possum densities were generally low compared with the lower altitude forest. In August 1990 faecal pellets were found in 4.7% of plots and after the September poison drop (February 1991) 2.7% of plots. Ship rats were the only rodent found during the pre and post drop assessment of rat density. In late July the rat index was 3.8% and the post poison assessment in October revealed no rats. However, by February the index was up to 6.5% (Pierce and Montgomery 1992).

Stoats are present within the population area and a cat was trapped along Waoku Road on the edge of this area.

2.3 Other Areas

Kokako have been recorded from Marlborough Forest, Raetea Forest and Warawara Forest. A walk through survey for kukupa and kokako is likely to be done in Raetea Forest during the 1992/93 summer, but Warawara and Marlborough Forests have not been formally identified as priority survey areas. N.B. The Raetea survey undertaken early in January 1993 with local dialect song tape and experienced observers located no kokako south of the Mangamuka Road saddle (R Pierce pers. comm.).

3.0 OPTIONS FOR MANAGEMENT

Based upon current knowledge of the kokako population characteristics of Puketi and Waipoua/Mataraua and assuming that there are no large undiscovered populations in Northland, there are four main options for management of the remaining Northland kokako.

(a) Transfer any "remnant" pairs to Kapiti Island

This option is conceivable for both the Puketi and Waipoua populations if in situ management was not undertaken. Given the low number of pairs in either population and the apparent rapid and documented decline of the Puketi population, it is preferable to allow the removal of remaining pairs to Kapiti than to completely lose their genetic contribution. It would, however, be unfortunate to lose these birds from Northland if there is the possibility of effectively protecting and managing them in their own geographic region.

(b) Transfer any "remnant" pairs to Hen Island (Taranga)

This option is preferable to the above in that the birds would be retained in the geographic region of their origin and is in keeping with objective 3 in the recovery plan. Given the apparent rapid decline of birds in Puketi it must be prudent to give serious consideration to moving the remaining six pairs even though they do not completely fit the criteria in the recovery plan. (Criteria include 3 or fewer pairs in the population and priority given to small remnant forest blocks.) In Northland it appears that the truly small remnant forests have long since lost their kokako. However, if remnant pairs are found in Raetea, Warawara or Marlborough Forests, they should also be given a high priority for transfer to Hen Island.

(c) Manage a population on the mainland

This option, while being the most expensive long term option, is seen in the recovery plan as having many advantages and some limiting factors (see options for recovery, p.15 North Island kokako recovery plan).

(d) Do nothing

This option is very cheap but unfortunately may result in the complete loss of kokako from Northland as well as the loss of a potentially important genetic contribution to the species.

4.0 DISCUSSION

Hen Island is approximately 500 ha of diverse mature coastal forest. It has only one introduced mammal - the kiore, which is also present on Little Barrier and does not appear to have a significant impact on kokako. Even if habitat conditions require kokako to have 16 ha territories (Puketi's average territory size was 6.5 ha, Best and Bellingham 1991) that is still 30 territories, each of which may sustain a pair.

Long term "replenishment" of mainland populations may be possible by cropping progeny from Hen Island. By establishing mistnet sites in 4 or 5 of the best quality pair territories it may be possible to remove breeding pairs at a rate which is sustainable to the Hen Island population. Research at Rotoehu suggests that while pairings change quite frequently, territories which have previously held pairs generally continue to do so, perhaps indicating that habitat quality is an important factor.

The quality of habitat on Hen Island, while being quite different in composition from existing Northland habitats, appears to be mature and diverse enough to support kokako. Important potential kokako food present on Hen Island includes tawa, taraire, kohekohe, mahoe, *Coprosma* spp. and pigeonwood.

Hay 1981 describes kokako as "sequential specialists" which require a diversity of food species, some of which are foraged disproportionately in relation to their occurrence within the forest. Two factors which may be important to kokako survival and breeding are the high use of shrub hardwoods within Puketi Forest (Best and Bellingham 1990) and the high use of invertebrates in spring. However, these trends are highly variable between and within years.

Management of kokako on the mainland is the preferred option for recovery in the North Island kokako recovery plan. That document suggests that "...kokako will persist on the mainland only if concerted efforts are made for their conservation in the next few years." (p.15). We are now into "second generation" research and management on this bird, and there is every chance that with proper support we can succeed."

To date, the most manageable population known in Northland is the Waipoua/Mataraua area where easy access, and high bird density and pair/single ratio all contribute to a potentially compact management unit. The population is small at about 16 known birds, and for this reason it was considered too small to contribute robust data to the Research by Management programme which is concentrating solely on the largest and most intact populations in New Zealand. However, management of this area is directly supported by the recovery plan and fits most of the applicable objectives. They are:-

Objective 1: Determine the relative importance of the causes of the current decline of North Island kokako

This population contains at least 2 pairs which have bred or attempted to breed in the last few years and at least one other pair were strongly suspected of making an attempt at breeding i.e. very secretive and one bird absent for long periods. This is important as objective one requires "a close study of the breeding and mortality of as many kokako populations as possible" to determine why breeding attempts are failing.

Objective 2: Determine successful management techniques for the conservation of North Island kokako

The Research by Management (RbM) programme is attempting to identify the most successful (in terms of producing more kokako) management methods and identifying the key culprits of the kokako's continued decline. It has been very difficult to gain scientifically valid information, but indications are that the large scale treatments used to date are achieving a measurable increase in chick production at both Mapara and Kaharoa (see table 1). The recovery plan states "...the RbM programme is an important and valuable one, both for seeing if current mammal control efforts increase kokako numbers and for improving mammal control and monitoring systems." It further states that "...more deliberate effort to experiment in a formal way with control and monitoring techniques is required."

Table 1

	Kaharoa			Mapara		
	Pairs	**Singles**	**% Pairs**	**Pairs**	**Singles**	**% Pairs**
1992	12	4	86	17	15	52
1990	7	8	64	14	17	45

The type of management envisaged at Waipoua/Mataraua would combine the results of research to date including the "time lapse videography" being employed at Rotoehu, to target known and strongly suspected predators in the most cost effective way possible.

Objective 6: Survey potentially important but poorly known populations

A vital prerequisite for either translocation of birds or mainland management is good survey information. Both Omahuta and Raetea Forest are known to contain kokako but have never been formally surveyed. It is crucial that these and any other likely kokako habitats are formally surveyed using the most local dialect tape possible in the method described in Speed *et al.* 1988. This should identify (1) any other potential management blocks, and (2) any "remnant" pairs which may be suitable for transfer to Hen Island. Northland is one of the top priority areas for survey in the recovery plan (p.30).

Objective 7: Monitor critical populations

Monitoring is an important facet of any management programme as without proof of success it is impossible to justify the management. Basic monitoring would quickly quantify the success or failure of any management undertaken in Northland. Such monitoring would include at least a pre-breeding census of pairs and a post-breeding juvenile survey, but could include monitoring of rat/possum numbers, breeding attempts and plant phenology.

Objective 8: Monitor all kokako work and be prepared to respond to change

Kokako have been studied for over 20 years, but it seems that we are only now on the verge of identifying the critical factors of kokako decline. Time lapse videography allows a graphic and immediate insight into nest predation but still has a very limited sample base. However, it is likely that the next few years will provide answers to the many management questions

still unanswered. In the meantime we must utilise what knowledge we have gained in such a way as to provide more answers to long term management problems.

Objective 9: Promote public interest and involvement in kokako conservation

Kokako are one of our few endangered birds which are still surviving on the mainland. Their management has profound implications for the long term future of many other species and it is important that the Department of Conservation is seen to be taking a leading role in this type of species/ecosystem management. Of central importance in Northland is the inclusion of the tangata whenua at all levels of the decision making process. Iwi must be informed and involved from the earliest stages of the planning process right through to the implementation of a management regime.

5.0 RECOMMENDATIONS

To effectively manage kokako in Northland, three steps should be taken:-

(i) Survey the remaining areas of potential kokako habitat.

(ii) Manage the most robust population remaining in Northland.

(iii) Transfer pairs from suitable "remnant" populations to Hen Island.

5.1 Explanation

Plans have already been made to continue surveying the Puketi and Raetea populations. Omahuta could be a continuation of this resurvey undertaking. If birds are located in any numbers, more intensive territory mapping will be required. Warawara will require at least two mornings surveying the most likely (best quality forest) ridge systems. This should be undertaken in summer/autumn 1993.

(ii) Presuming that no large "hidden" populations are located, management should commence in the Waoku Coach Road area of the Waipoua/Mataraua continuum in October 1993.

1. Post breeding surveys are to be undertaken during the 1992/93 breeding season in Puketi and Waipoua which will help to bolster the pre-management data base. Further effort should be made at this time to territory map any pairs within the Waipoua/Mataraua population in order to assist future ground poisoning operations.

2. Rat and possum indices may be beneficial to the data base as from February 1993 in order to assess the effectiveness of management upon target mammals. Some information already exists.

3. Apply 1080 in Wanganui No. 7 pollard baits with a cinnamon lure as per the 1990 operation to 5-600 ha centred on the densest grouping of pairs in the population during the first fine period in October (figure 2). It could be argued that an aerial operation is not necessary if a ground operation (see below) is to follow. However, it is vitally important that early nesting attempts are given the greatest chance of

success as predators will be in greater abundance in mid-late summer. Other advantages include:

- Less competition at bait stations will mean that low possum/rat densities will be quicker to achieve and easier to maintain.

- Territorial boundary shifts are known to occur in some populations. An aerial drop will minimise the risk of poorly placed bait stations.

4. Establish weatherproof bait stations at 100 m intervals on a 400 x 500 m grid in all known pair territories. This will effectively cover c. 20 ha of forest within which each pair's territory, and presumably any nests, will be located. These stations will be designed to allow access to possums and rats equally and will be baited with an appropriate waterproof toxic bait. Both 1080 and Pindone may be suitable and could be alternately pulse fed, but Pindone is not as effective on possums as 1080. Possums should be treated as potential predators throughout the operation. Rat numbers will be low following the aerial drop but sustained poisoning until February will keep numbers extremely low as reinvasion from such a small drop is likely to be rapid.

   Grid line poisoning for rats has been known to reduce rat density to a level comparable to a 1080 aerial operation, with the advantage of being sustainable for a longer period (John Innes pers. comm.).

5. Operate a Fenn trap line through the area to target mustelids. These traps, set in tunnels and baited with eggs, should be concentrated along access ways and dry ridges. As they are kill traps they should only require checking every 10-14 days, at which time bait stations would also be replenished.

6. Conduct a juvenile survey in March to ascertain whether successful breeding has occurred.

Following the completion of (a) above, initiate a translocation programme aimed at moving the least viable remnant singles and pairs from the smallest populations first. However, intensive monitoring and any further survey work required of the Puketi population must continue until the exact status of the population is known. If the dramatic reduction in kokako numbers evident to date is confirmed by further monitoring/survey, then the transfer of pairs from Puketi should become a priority.

The transfer of some single birds first may alleviate any concern that Hen Island may not be able to sustain kokako but such a delay may only serve to further reduce the number of available pairs.

5.2 Approximate Costing

Management

100 x poison stations at $8.00 (initial outlay only)	$ 800
1 aerial operation 550 ha at $16.00/ha	$8,800
4 person days/month x 4 = 16 at $100/day	$ 1,600
Miscellaneous - poison, vehicle running etc.	$ 1,000
	$10,400

Monitoring

5 person days in September
5 person days in February

Translocation

Using existing expertise and equipment from Bay of Plenty Conservancy and a figure which has been quoted from past kokako capture work it is likely that this operation would cost in the order of $3,000 per pair. This figure does not take into account transmitters or monitoring, holding birds in captivity for 10 days or the cost of transfer.

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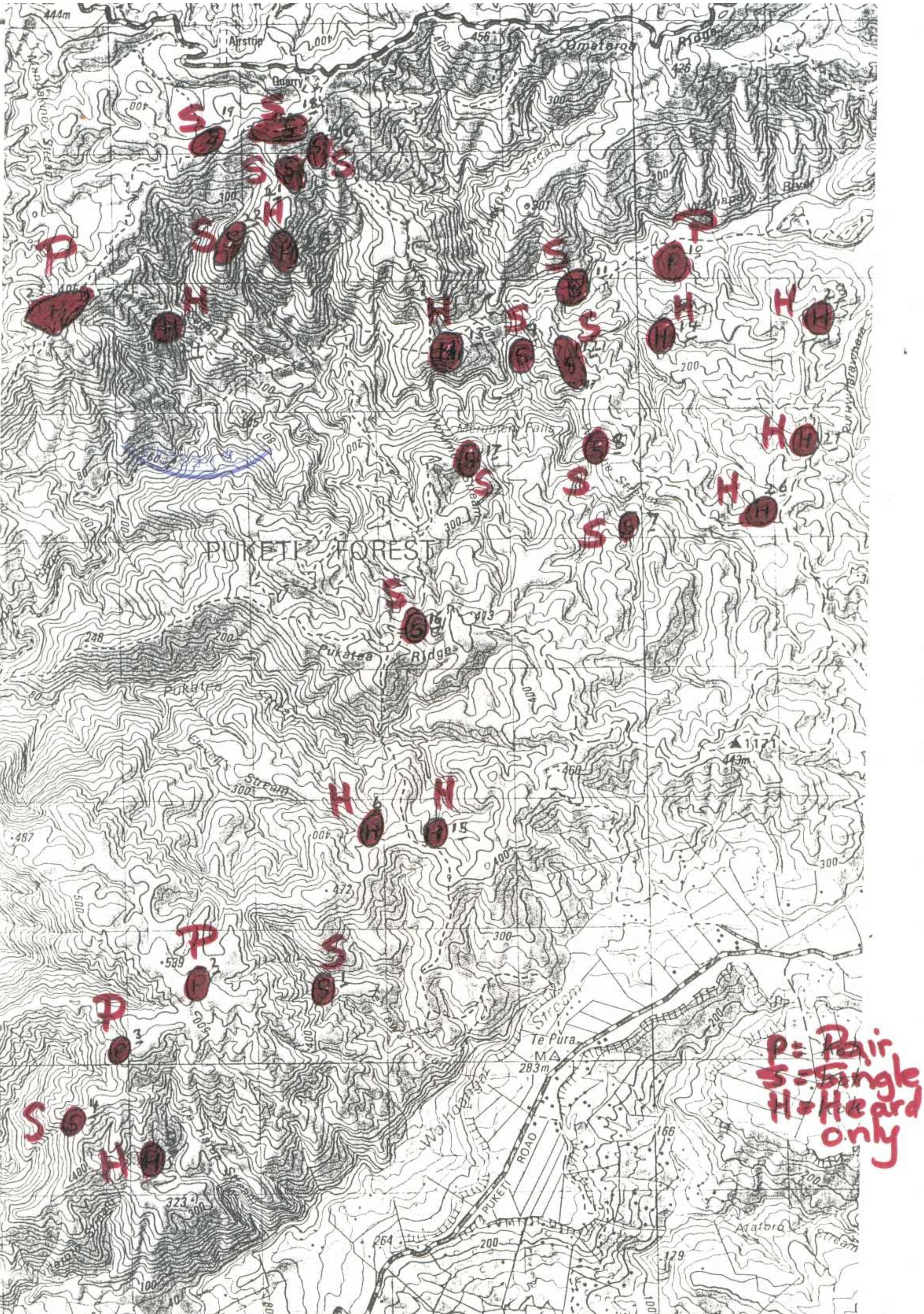
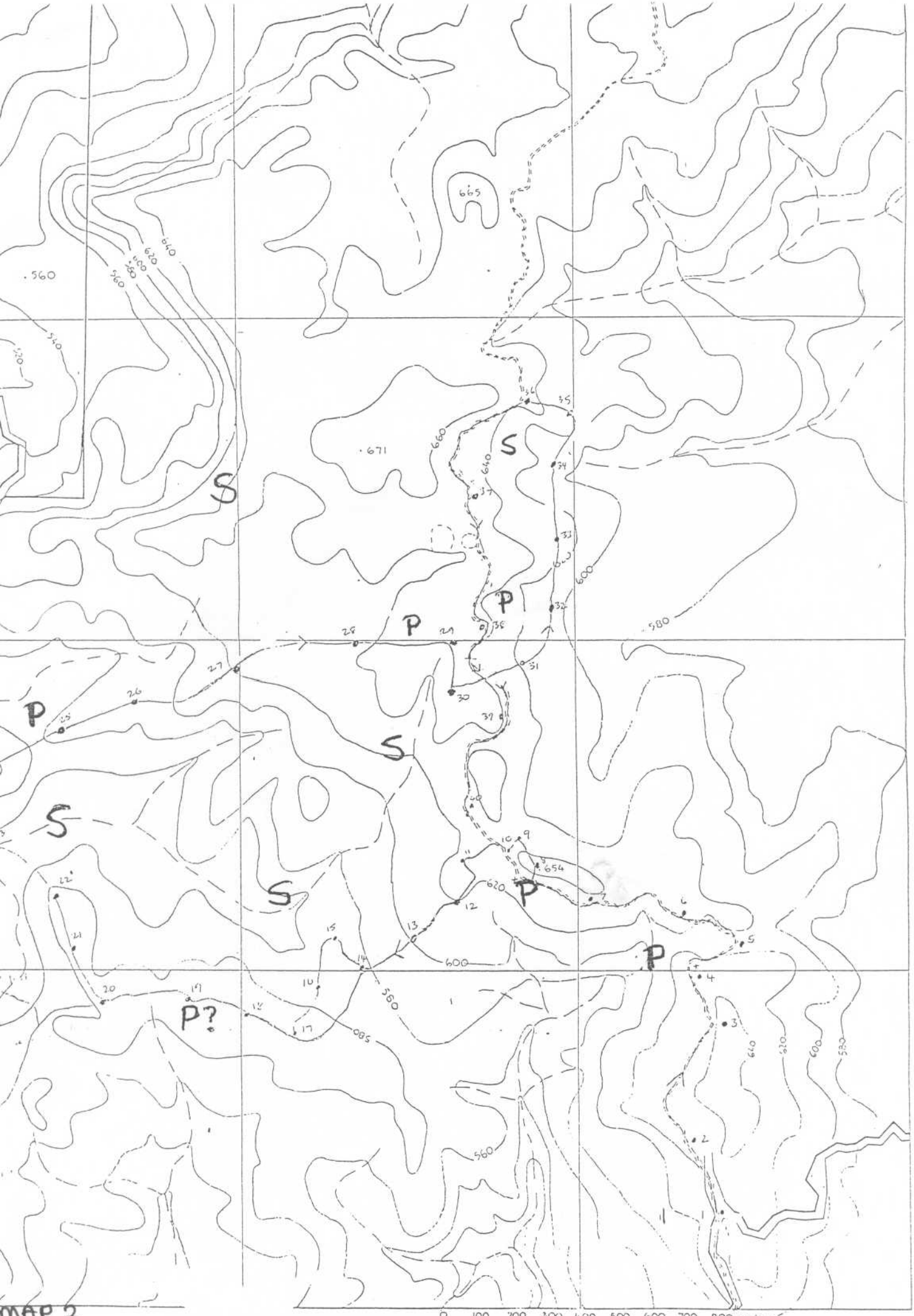

Airstrip
Quarry
Ridge
PUKETI FOREST
Pukatea Ridge
Te Pura
283m
PUKETI ROAD
P= Pair
S= Single
H= Heard only

MAP 1



MAP 2
Distribution of kokako pairs (P) and singles (S) Waipoua 1990-91 season.