



19-E-0533 DOC-6048227

28 August 2019

s 9(2)(a)

Via fyi.org

Dear s 9(2)(a)

I refer to your official information request of 5 August 2019 seeking information on the recent 1080 operation in the Hunua Ranges.

Our letter of 14 August 2019 advised that we have transferred part of your request to Auckland Council. This letter forms the Department's response.

Translocation of kōkako

1) about the number of kokako that have been moved from a breeding facility to the Hunua Range after 1080 aerial poisoning. This pertains particularly to the most recent poison operation last year, but if there have been other times that kokako have been moved from one rohe to the Hunua Range after other drops, please include those in this information request.

As part of the Kōkako Recovery Plan, kōkako have been translocated between forests, including into the Hunua Ranges. These translocations are listed in the attached document *Kōkako Survey Report Hunua 2018*. Note that no kōkako have been translocated from 'breeding facilities'.

The donor forests of the translocated kōkako are also managed with 1080. The ongoing expansion of those kōkako populations as a result of low predator numbers following 1080 operations allows the translocation of some kōkako out of these areas to boost existing kōkako populations elsewhere, or seed new ones.

We have withheld the names of individuals and identifying information from the document we are providing, under sections 9(2)(a) and 9(2)(g) of the Official Information Act 1982 to protect their privacy and to prevent any improper pressure or harassment of officials or employees. In making this decision, we have taken into account the public interest considerations set out in section 9(1) of the OIA.

Rationale for use of aerial 1080 in the Hunua Ranges

3) In addition, could you please explain DoC and Auckland Council rational of why the Hunua Range, being easily traversed terrain and so close to a large population, was poisoned instead of using ground control management of pest species.

And please explain the cost comparison between the aerial poison operation and what it would cost if a land-based pest management system, and if DoC/Council had put that to public tender?

Our letter of 14 August 2019 advised that we transferred this part of your request to Auckland Council.

However, we would also like to explain that, although the kōkako management area of approximately 2,000 hectares has used intensive trapping and bait stations for many years, this has not maintained rodent, possum and mustelid numbers within this relatively small area at the target level that will allow kōkako to breed.

Even if these methods were more successful in the kōkako management area, to treat the full 20,000 hectare of the operational area using traps and bait stations would not be possible. Many parts of the Hunua Ranges are steep and access is difficult. Bait stations or traps would need to be set in a grid with 100-metre spacing for possums and 50 metres for rodents, requiring many hundreds of kilometres of tracks to be cut into the bush. Not only would this network be physically unfeasible to build and maintain, but it would also have a significant, negative impact on the flora and fauna. For example, the risk of introducing kauri dieback through root disturbance would be increased.

The issue, therefore, is not simply one of cost but also feasibility and effectiveness.

Monitoring in the Hunua Ranges

4) In addition, could you please tell me, if any, what post-1080 poison operation ecological testing DOC and Auckland Council have carried out on the Hunua Range that pertains to invertebrate numbers and health, soil health - including worms, soil fungi and bacteria, fluoride concentrations in the soil, leaf litter decomposition, and so on. (thinking about how the "Wood Wide Web" would be affected such as this <https://www.sciencemag.org/news/2019/05/wood-wide-web-underground-network-microbes-connects-trees-mapped-first-time>)

While not related to 1080 operations, the Department conducts a kōkako survey in the Hunua Ranges every four years. As explained above, we are providing you with the document *Kōkako Survey Report Hunua 2018*, which comprises the results of this survey. Note that it is only coincidental that the survey took place in the same year as a 1080 operation, and the surveying took place both before and after the operation. The previous kōkako survey took place in 2014, and the previous 1080 operation in 2015.

You have the right to seek an investigation and review by the Ombudsman of this decision. Information about how to make a complaint is available at www.ombudsman.parliament.nz or freephone 0800 802 602.

If you wish to discuss this decision with us, please feel free to contact me at this email address.

Please note that this letter (with your personal details removed) and enclosed documents may be published on the Department's website.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'Hilary Aikman', with a stylized, cursive script.

Hilary Aikman
Director, National Operations

Document schedule

Item	Date	Document description	Decision
1	7 January 2019	Kōkako Survey Report, Hunua 2018	Released in part

Kōkako Survey Report

Hunua 2018

Summary Report Prepared For the Department of Conservation

s 9(2)(a), 9(2)(g)



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1. SUMMARY

North Island kōkako belong to the endemic New Zealand wattlebird family (*Callaeidae*), an ancient family of birds which includes the North and South Island tīeke (saddleback) and the extinct Huia. Prior to human habitation, kōkako were common in forests throughout the North Island. As a consequence of historical forest clearance and depredation by introduced mammalian predators, the population and range of the kōkako was reduced dramatically to around 330 pairs by 1999. All current populations must be continually managed against introduced mammalian predators by sustained pest control (Flux and Innes, 2001). This control has led to a marked recovery of the species nationally, allowing for kōkako translocations to be carried out to re-establish new populations across their former range. The North Island kōkako is classified as 'at risk - recovering' and the population now exceeds 1,600 pairs (Robertson *et al.* 2017).

This report summarises the results of a North Island kōkako (*Callaeas wilsoni*) survey conducted in the Hunua Ranges in September and October, 2018. The Hunua kōkako population is one of 11 remnant populations, and is situated in the Hunua Ranges Regional Park, approximately 40 km southeast of Auckland City.

The survey was coordinated by the Department of Conservation, with contractor and logistical support provided by Auckland Council, and followed best practice methodology (Flux and Innes, 2001). 106 kōkako pairs and 16 territorial singles were recorded in the 2018 survey. Results are compared to previous surveys and recommendations for future management are made. The key recommendation of this report is that the annual control of mammalian predators, using either ground-based or aerially applied toxin targeting ship rats and possums, is continued, with the target of recovering the Hunua population to 250 pairs by 2025.

To promote rapid population growth, the recommended targets for pest control operations are to reduce ship rat and possum abundances to a residual trap catch (RTC) of one possum per 100 trap-nights and a 1% ship rat tracking index (RTI) at 1 November each year (Flux and Innes, 2001).



2. METHODOLOGY

2.1. Study Site

The Hunua Ranges Regional Park is situated approximately 40 km southeast of Auckland city and encompasses over 16,000 hectares of native forest ranging in elevation from sea level to 688 metres above sea level. Approximately 2,000 hectares of the Hunua Ranges Regional Park annually receives intensive mammalian pest control, coordinated by Auckland Council, for kōkako recovery. Vegetation within these areas is a mix of logged and unlogged podocarp-hardwood forest dominated by tawa (*Beilschmiedia tawa*) and rewarewa (*Knightia excelsa*), with emergent rimu (*Dacrydium cupressinum*) and northern rata (*Metrosideros robusta*). Sub-montane communities dominated by tawheowheo (*Quintinia serrata*) occupy the higher ridges. The study area encompasses the upper catchments of the Orere, Mangatawhiri, Konini and Lilburne streams.

Studying the Hunua population, St. Paul and McKenzie (1974) were the first to attribute declines in kōkako almost entirely to the effects of introduced predators, in particular nest predation by ship rats (*Rattus rattus*). St Paul and McKenzie (1974) estimated that approximately 500 kōkako inhabited the Hunua in 1957, but their population estimate fell to 50 by 1967. A total of 60-70 kōkako were located in surveys between 1971-72, but this increase is attributed to more intensive search methodologies, rather than any population recovery (St Paul and McKenzie, 1974). Four surveys between 1986 and 1988 conducted by the Auckland Regional Authority (ARA) and the Ecology Division of DSIR, assisted by members of the Ornithological Society, recorded 40 individuals, including six pairs (MacMillan and McClure, 1990).

Between 1950 and 1990, there were very few reports of kōkako breeding in the Hunua. Two juveniles seen adjacent to the Kohukohunui track in 1986 indicated that some birds were still nesting successfully in the area at that stage (MacMillan and McClure, 1990). In 1994, a Department of Conservation (DOC) survey located 25 kōkako, including four pairs. However, it was later determined that four of these five pairs were male-male pairings. Male-male pairings between kōkako have been reported from other declining kōkako populations, a result of male bias within



populations, as females are more vulnerable to depredation during incubation and brooding (Flux and Innes, 2001).

As the Hunua kōkako population stemmed from just one female, and there was an evident male bias, four female kōkako were translocated from Mapara Wildlife Reserve in 1998 to increase genetic diversity. One female paired with a Hunua male, but was preyed upon by a stoat before breeding. The other three females all spent several months within the KMA, but subsequently dispersed beyond the KMA and were not re-sighted (Overdyck, 1999). In subsequent translocations, both males and females were translocated. 14 further kōkako were translocated from Mapara in 2006, and 4 from Waipapa Ecological Area (Pureora Forest Park) in 2007. 12 further kōkako were translocated from Tiritiri Matangi Island between 2007 and 2012 (including via egg-swaps).

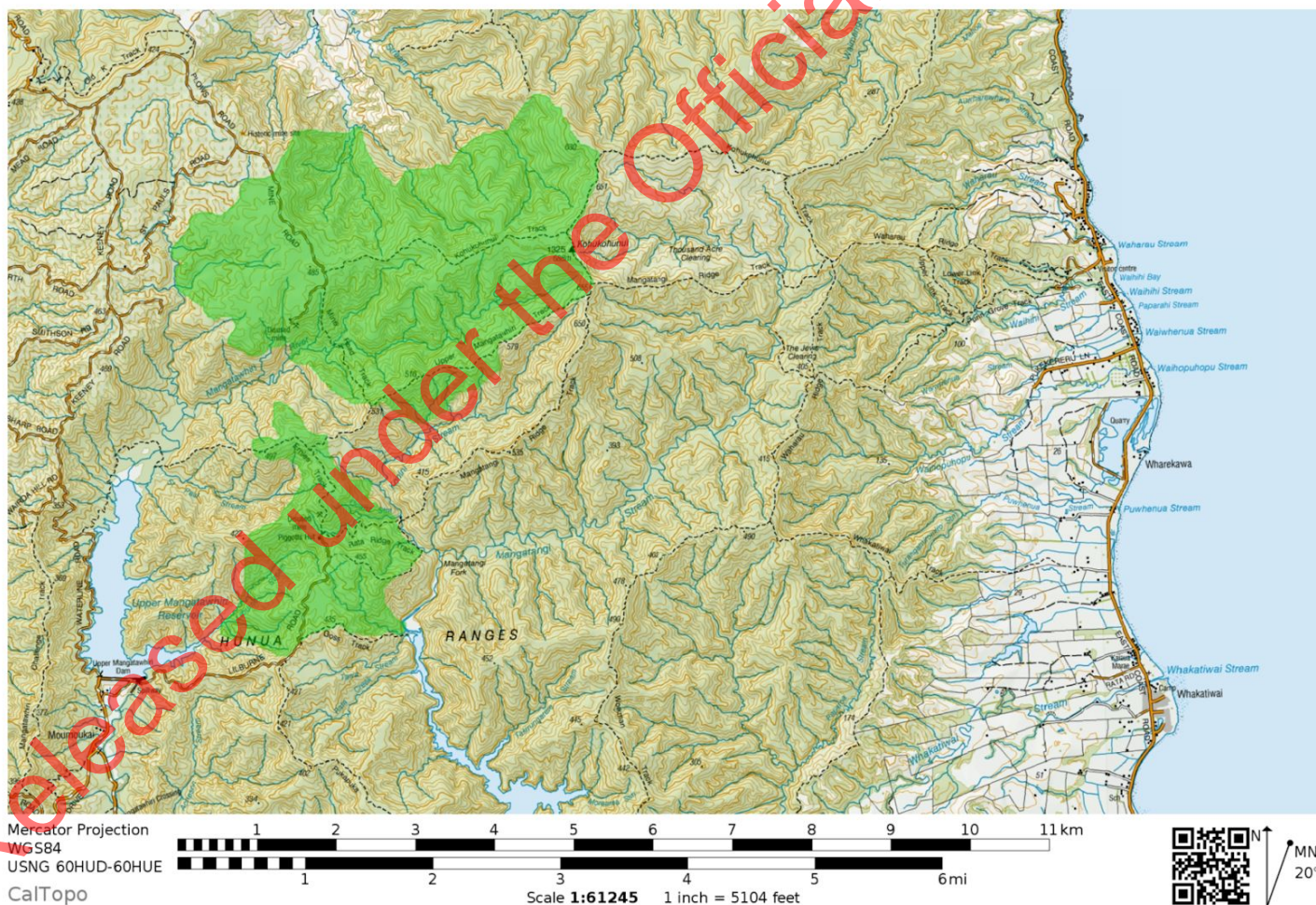


Figure One: Map of the ground control network for kōkako recovery in Hunua Ranges (in green)



The preceding (2014) kōkako survey, undertaken by Department of Conservation (DOC) staff and contractors, recorded 118 territorial adults comprising 55 pairs and 8 singles within the KMA and adjacent Piggott's Management Area. Of the territorial adults observed, 14 individuals (13%) were translocated birds, and the remainder (87%) were Hunua born. In a further walk-through survey of adjacent forest outside the management areas in 2014, coordinated by Auckland Council, 5 pairs and one territorial single were found.

Table 1: Summary of Kōkako Translocations to the Hunua, 1998-2016.

Source	Date	Number of Birds
Mapara	1998	4 (4 Females)
Mapara	2006	14 (8 Males, 6 Females)
Tiritiri Matangi Island	2007	4 (4 Females)
Waipapa	2007	4 (1 Male, 3 Females)
Tiritiri Matangi Island	2008	4 (3 Males, 1 Female)
Tiritiri Matangi Island	2010	3 (1 Male, 2 Females)
Tiritiri Matangi (egg swap)	2012	2 fledged (one banded, gender unknown)
Mapara	2015	6 (3 Males, 3 Females)
Mangatutu	2015	6 (3 Males, 3 Females)
Mangatutu	2016	7 (4 Males, 3 Females)
TOTAL		53 (23 Males, 29 Females, 1 Banded Bird-Sex Unknown)

Genetic analyses of kōkako indicate low genetic variability within extant populations, and the small population sizes and the absence of natural dispersal and immigration between populations means that populations with few founders are expected to lose diversity over time. Consequentially, a target of 40 unrelated kōkako recruiting into the Hunua population was set (following Weiser, 2015). To this end, a further 6 kōkako from Mapara and 13 from Mangatutu Ecological Area (Pureora) were translocated in 2015 and 2016 (Authority 45499-FAU), coordinated by Auckland Council (Table 1).



2.2. Survey Technique

The 2018 kōkako survey at Hunua was conducted between September 4 and October 5. This work was primarily undertaken by five Department of Conservation temporary staff and one Auckland Council contractor. They were assisted by six other DOC and Auckland Council staff and volunteers.

Following the standard adult census methodology detailed by Flux and Innes (2001), the 2,000 hectares currently receiving annual pest control for kōkako were surveyed using transects 100-150 meters apart. Transects were walked slowly whilst listening for kōkako. Whilst surveys at other sites cover transects up to 200 meters apart, the topography of the Hunua necessitates more thorough coverage. If kōkako were not immediately detected, pre-recorded local dialect was broadcast using Foxpro NX4[®] playback units at approximately 200 meter intervals along each transect to elicit a response from any territorial kōkako. The recordings used for playback were freshly recorded prior to the survey and included local dialect as well as those from all translocation source sites.

Playback at each survey point consisted of:

- 1) 3 'mew' calls, followed by a 5 minute listening period
- 2) 3 'mew' calls, followed by a 5 minute listening period
- 3) 30 seconds of recently recorded song, followed by a 5 minute listening period

All birds seen or heard were followed to determine whether they were territorial, and whether they were single or paired. Follows were recorded using Garmin GPS units to determine territory boundaries. Following Flux and Innes (2001), birds were determined to be territorial if the following was achieved:

- a) One follow of at least 30 minutes, during which a bird (single or at least one of a pair) sung full song, or;
- b) Two follows of at least 10 minutes each on two different days in the same location, during which a bird (single or at least one of a pair) sung full song.

Where one or both kōkako of the pair was banded, they could readily be distinguished from adjacent pairs, thereby avoiding possible inaccuracies from double counting or clumping of



sightings. First, surveyors worked in parallel to one another along transects, and were in radio communication. Where adjacent unbanded pairs were followed simultaneously they could consequently be determined as separate. Second, all follows were saved on GPS units. Where surveyors could not determine whether the unbanded pair being followed was different to a previously located unbanded pair, the birds were 'dragged' using playback across the previous follow. If the pair being followed sung full song in an area where a previous unbanded pair had previously been observed, and no other pairs were heard or seen in the vicinity, the two follows were assumed to be the same pair.

As the breeding season commenced earlier than it has previously, and one pair was observed incubating three eggs as early as October 3, the birds determined to be territorial singles during the final week of the survey were all re-followed on October 4-5 for up to one hour, to confirm that they were indeed single, and not males with females incubating eggs.

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3. RESULTS

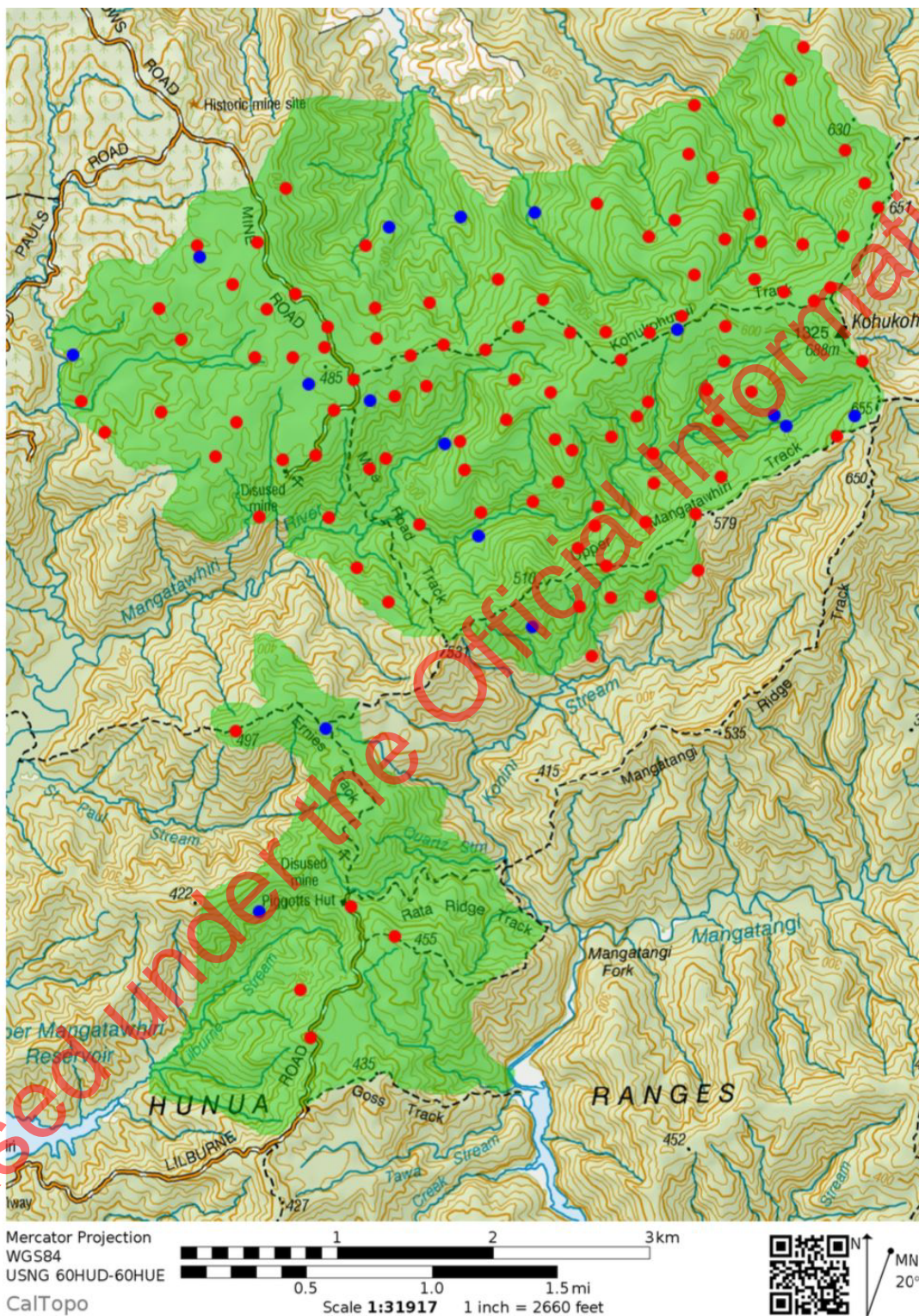
The 2018 Hunua survey was completed in 687 person-hours over 26 survey days between September 4 and October 5. Weather conditions were mostly favourable during the survey period, and scheduled survey days that were windy and rainy were rescheduled to deliver an accurate survey result. Surveying continued from dawn until approximately noon each day.

A total of 228 territorial adults were located, of which 22 (10%) were individuals that have been translocated to Hunua, and the remainder (n=206, 90%) were Hunua-bred. The 228 territorial adult kōkako comprised 106 pairs and 16 territorial singles (see Figure 2). This is an increase from 55 pairs and 8 singles observed in the 2014 kōkako survey (Figure 3). 101 pairs were recorded in the KMA and 5 pairs were recorded in Piggott's (Table 1). Six pairs (including 2 translocated individuals paired to unbanded mates) and five singles were located in newly added management blocks not included in the 2014 survey result.

Table 2: Hunua survey results by management area

	KMA (1500 ha)	Piggott's (500 ha)	TOTAL (2000 ha)
Pairs	101	5	106
Territorial Singles	14	2	16
Total No. Individuals	216	12	228

Of the 106 total pairs located, with 42 comprising at least one banded kōkako, 10 had both kōkako banded and thus the lineage of each known. Two pairs were each of relict Hunua lineage. Two pairs consisted of translocated Mapara birds paired to birds of relict Hunua lineage. A further Mapara female was paired to a Hunua-born bird of mixed lineage. A Tiritiri male was paired to a Hunua-born banded female of unknown lineage, and a Tiritiri female was observed paired to a Mapara male. The remaining pairs where both birds were banded were pairings of Hunua-born birds with mixed or unknown lineage.



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Figure 2: Map of territorial kōkako pairs (red) and singles (blue) within the areas managed for kōkako recovery in the Hunua Ranges (green shading).

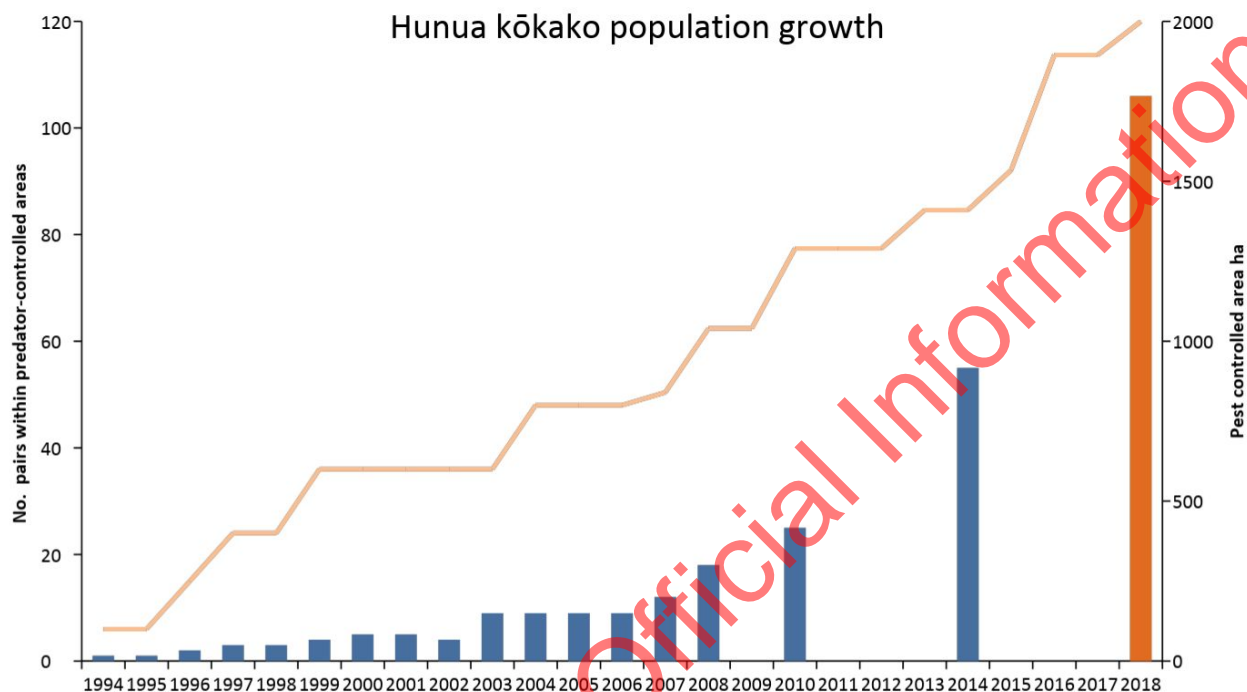


Figure 3: Growth in kōkako pairs within ground control areas, 1994-2018.

Two of the kōkako located in the final week of the survey were counted as territorial singles, after being observed for over one hour each with no indication of a mate. However, both these individuals were in territories occupied by pairs in the 2014 survey, and may have been males paired to incubating mates. As such, the total pair count is likely conservative.

2.1 COLOUR BAND RESIGHTING

52 banded territorial kōkako were located in the 2018 survey, an increase from 31 banded territorial individuals in the 2014 survey. Of the 31 banded territorial kōkako observed in 2014, 27 (87%) were re-sighted in this survey. One kōkako seen in the 2010 survey, but not in 2014, was again re-sighted this survey. One kōkako only had a metal band on the left leg, so could be one of several individuals having lost colour band(s), but could be differentiated from other kōkako observed in this survey.



Of 4 territorial birds observed in the 2014 survey but not in this survey, two were kōkako translocated from Mapara in 2006 as adults, one was an adult female translocated from Tiritiri Matangi in 2008, and one was banded as a nestling in Hunua in 2010.

2.2 RECRUITMENT OF HUNUA BRED KŌKAKO

13 of 23 kōkako (57%) banded as nestlings and known to have fledged following the 2014 survey were observed, of which 12 were territorial. Juvenile kōkako can take two years or more to recruit into the population (Basse et al., 2003), so fledglings from later breeding seasons may be present but not yet territorial. Younger birds not yet holding territories do not sing full adult song. Consequently, they are less likely to be detected using the adult census methodology and are more likely to be observed in multiple locations.

Seven of nine (78%) banded kōkako known to have fledged in the 2015-16 season were observed, and all were holding territories with partners. Three of nine (33%) banded kōkako known to have fledged in the 2016-17 season were observed, including one territorial single and one non-territorial individual. Three of six (50%) banded kōkako known to have fledged in the 2017-18 season were observed, one of which was a territorial single.

2.3 RECRUITMENT OF TRANSLOCATED KŌKAKO

Historically, 3 kōkako with relict Hunua lineage contributed to the current kōkako population. This population has been supplemented by translocation to increase genetic diversity, with a target of the successful recruitment of 37 unrelated translocated individuals into the population (to sum 40 unrelated founders), coupled with rapid population growth to maintain the retention of rare alleles.

In total, 11 of the 19 kōkako translocated to Hunua in 2015-16 were observed in this survey, of which 10 were paired and territorial. An additional 22 kōkako translocated between 2006 and 2012 were re-sighted as paired territorial adults birds between 2008 and 2018. The breakdown of recruitment is detailed below:



Mapara Wildlife Reserve

5 of the 6 kōkako translocated from Mapara in 2015 were observed in territorial pairings during this survey. Although each was translocated with a mate, all observed birds were paired to unbanded Hunua-born birds. The sixth kōkako (a male) was observed six months following release but was not detected this survey. This follows the successful recruitment of all 14 kōkako translocated from Mapara in 2006 as observed in the 2008-2014 surveys.

Mangatutu Ecological Area, Pureora Forest Park

6 of the 13 kōkako translocated from Mangatutu (3 of 7 males, 3 of 6 females) in 2015-16 were observed in this survey. 5 (3 females, 2 male) of these individuals were each paired to an unbanded Hunua born mate, and the sixth (a male) was non-territorial. A further non-territorial kōkako with Mangatutu dialect was observed in Piggott's Management Area but was not identified. Only one of six kōkako translocated from Mangatutu in 2015 was re-sighted, while five of seven translocated in 2016 were located.

Waipapa Ecological Area, Pureora Forest Park

Four kōkako (3 females, 1 male) were translocated to Hunua from Waipapa in 2007. One female was located this survey, paired to an unbanded bird. Two others were observed in the 2008 and/or 2010 surveys as paired and territorial adults.

Tiritiri Matangi Island

3 of the 12 kōkako translocated from Tiritiri Matangi Island between 2007 and 2012 were located this survey, including one banded individual from a successful egg-swap in 2012. Four other Tiritiri Matangi kōkako were seen as paired individuals within the management areas in the 2010 and/or 2014 surveys. However, as the Tiritiri Matangi population is itself established by translocation, all recruited Tiritiri Matangi individuals collectively represent the genetic lineage of 4 founders.

**Table 3:** Summary of outcomes of translocations to Hunua Ranges

Source	Birds	Birds Resighted	Effective Founders
Hunua	-	-	3
Mapara (2006-15)	20	20	19
Mangatutu (2016-17)	13	6	5
Waipapa (2007)	4	3	3
Tiritiri Matangi (2007-12)	12 (incl. egg swap)	7	4
TOTAL	49	36	34

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4. DISCUSSION

The results of population monitoring are important for ecological managers. Understanding the rate of population growth and the distribution of kōkako can allow managers to adapt their decision making processes to promote the species' recovery (Parker *et al.*, 2013).

4.1 Recruitment and Population Growth

The Hunua population increased from 55 pairs to 106 pairs between the 2014 and 2018 survey, an average growth of 18% per annum. However, at least 11 translocated kōkako recruited into the population between 2014 and 2018. If it is assumed that these kōkako recruited in the year they were translocated, the average growth is reduced to 16% per annum. This growth is slower than the average annual growth between the 2010 and 2014 surveys. This reduction in growth rate may be because an increasing proportion of kōkako are dispersing beyond the existing managed areas as the population within these areas tends towards carrying capacity. Alternatively, the reduction may be due to a poor breeding season in 2014-2015, when no monitored kōkako pairs successfully fledged chicks as a result of high rat abundances. However, even if the population growth is maintained at 16% per annum, the target of 250 pairs within the predator controlled areas is expected to be reached by 2024.

4.2 Further Translocations

As a result of translocations, 34 'effective founders' have now recruited into the population. It is recommended that additional kōkako are translocated as rapidly as possible to achieve the aim of 40 unrelated kōkako recruiting into the population. As we may expect greatest recruitment from kōkako translocated from Mapara, this is the preferred source site for additional top-ups. However, if Mapara is not available due to harvest restrictions, the next preferred option should be Waipapa, as this is the least genetically represented source site on the existing translocation permit.



4.3 Management Recommendations

Where populations grow rapidly from a bottleneck, loss of genetic diversity through drift is minimised (Jamieson *et al.*, 2008). As such, it is recommended that predator control continues to be conducted annually with a target of reducing ship rat and possum indices to 1% RTI and RTC respectively to maximise kōkako productivity.

Following the Kōkako Recovery Plan, the next kōkako survey should be conducted in 2022, and at 4 yearly intervals thereafter. If additional kōkako are translocated, the 2022 survey should follow the adult census methodology to determine recruitment of these individuals. However, subsequent surveys may follow a sub-sampling methodology, in consultation with the Kōkako Specialist Group, to reduce labour costs.

5. Key Recommendations

- Annual predator control to be continued with a target of reducing ship rat and possum indices to 1% RTI and RTC respectively
- Auckland Council to conduct a wider-area survey following the breeding season in April 2019 to detect the extent of spillover beyond the existing managed areas
- Conduct the next kōkako survey in 2022 and subsequently at four yearly intervals
- Future surveys to follow the methodology outlined in this report if additional kōkako are translocated to Hunua, with subsequent surveys to follow a sub-sampling methodology



ACKNOWLEDGEMENTS

Firstly, thanks to s 9(2)(a), 9(2)(g) for facilitating this work. Thanks also to s 9(2)(a), 9(2)(g) (Auckland Council) for coordinating park logistics. I am very grateful for the superb work done by the survey team of s 9(2)(a), 9(2)(g) and s 9(2)(a), 9(2)(g). Thanks also to s 9(2)(a), 9(2)(g) and s 9(2)(a), 9(2)(g) for assisting in this work.

Thanks to all the work put in over the years by Auckland Council staff, contractors and volunteers who have been involved in the project over the years, without whom this population wouldn't have been able to flourish in such a grand way. Thanks also to the DOC staff who have paved the way with the earlier Hunua surveys, in particular s 9(2)(a), 9(2)(g), who has been instrumental in the recovery of the kōkako in the ranges.

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APPENDIX 1: Kōkako Specialist Group Reporting

	2018	2014	2010	1994*
Date of Survey Period	Sept-Oct	Aug-Oct	Aug-Oct	-
Area Surveyed (ha)	Ca. 2000	Ca. 1500	Ca. 1450	?
Number of person hours used to survey	687	?	?	?
Number of surveyors	6	4.5	4.5	?
Total Pairs	106	55	25	1
Total Singles	16	8	9	23 (incl male-male pairs)
Total Juveniles	N/A	N/A	N/A	N/A
Did you follow Standard methods*?	Yes	Yes	Yes	Yes
Survey type used*	TA Census	TA Census	TA Census	TA Census
Did you record and use new/this years song/calls?	Yes	Yes	Yes	?
Other				
Comments:				
Survey Teams: § 9(2)(a), 9(2)(g)				
[Redacted]				
[Redacted]				
[Redacted]				

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APPENDIX 2: Summary of translocated kōkako resighting, 2008-2018

Name	Origin	Sex	Release	2008 survey	2010 survey	2014 survey	2018 survey
Ben	Mangatutu	Female	2015				no
Earlybird	Mangatutu	Male	2016				yes
Gatland	Mangatutu	Female	2016				yes
Grayling	Mangatutu	Female	2016				yes
Howick	Mangatutu	Male	2016				no
Mahaki	Mangatutu	Male	2015				no
Matariki	Mangatutu	Female	2016				no
Nene	Mangatutu	Female	2015				no
Nui	Mangatutu	Male	2016				yes (Non-territorial)
Porutu	Mangatutu	Male	2015				no
Richie	Mangatutu	Male	2015				no
Su	Mangatutu	Female	2016				yes
Tim	Mangatutu	Male	2016				yes
Amunsden	Mapara	Male	2006	yes	yes	yes	yes
Arab	Mapara	Female	2015				yes
Baboonito	Mapara	Male	2006	yes	yes	?	yes
Bananarama	Mapara	Male	2006	yes	yes	yes	no
Beaglehole	Mapara	Male	2006	yes	yes	yes	yes
Bombadiera	Mapara	Female	2006	yes	yes	yes	yes
Hani	Mapara	Male	2006	yes	yes	yes	no
Hinemairangi	Mapara	Female	2006	yes	yes	yes	no
Kikorangi	Mapara	Female	2015				yes
Mahuki	Mapara	Male	2015				yes
Merty	Mapara	Male	2015				no
Nancen	Mapara	Female	2006	yes	yes	?	no
Parahuia	Mapara	Female	2006	yes	yes	yes	yes
Puna	Mapara	Female	2006	yes	?	yes	yes
Ruahine	Mapara	Female	2006	yes	yes	yes	yes
Shankley	Mapara	Male	2006	yes	no	no	no
Speedbird	Mapara	Female	2015				yes
Taranga	Mapara	Male	2006	yes	yes	no	no
ToBe	Mapara	Male	2006	yes	yes	yes	yes
Werewere	Mapara	Male	2015				yes



<i>Chinook</i>	<i>Tiritiri</i>	<i>Male</i>	2008	no	no	no	no
<i>Eunice</i>	<i>Tiritiri</i>	<i>Female</i>	2007	yes	no	no	no
<i>Kahurangi</i>	<i>Tiritiri</i>	<i>Female</i>	2007	no	no	no	no
<i>Keisha</i>	<i>Tiritiri</i>	<i>Female</i>	2010		yes	no	no
<i>Matangi</i>	<i>Tiritiri(Egg swap)</i>	?	2012			yes	yes
<i>Ruby</i>	<i>Tiritiri</i>	<i>Female</i>	2007	yes	yes	yes	ye
<i>Shazbot</i>	<i>Tiritiri</i>	<i>Female</i>	2008	no	no	yes	yes
<i>Skippy</i>	<i>Tiritiri</i>	<i>Female</i>	2010		no	no	no
<i>Sweetie</i>	<i>Tiritiri</i>	<i>Male</i>	2008	yes	yes	no	no
<i>Te Karanga</i>	<i>Tiritiri</i>	<i>Male</i>	2010		yes	yes	yes
<i>Tsindi</i>	<i>Tiritiri</i>	<i>Male</i>	2008	no	no	no	no
<i>Wairoa</i>	<i>Tiritiri</i>	<i>Female</i>	2007	no	no	no	no
<i>Acapella</i>	<i>Waipapa</i>	<i>Male</i>	2007	yes	yes	no	no
<i>Allegro</i>	<i>Waipapa</i>	<i>Female</i>	2007	no	no	no	no
<i>Loki</i>	<i>Waipapa</i>	<i>Female</i>	2007	no	yes	no	no
<i>Stressor</i>	<i>Waipapa</i>	<i>Female</i>	2007	yes	yes	yes	yes

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