2024 Bird Survey in the Upper Waimata Valley

Survey and Report by Malcolm Rutherford

for

Waimata Catchment Group

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Executive Summary: 2024 Bird Survey in the Upper Waimata Valley

In November and December 2024, a repeat of the 2023 bird survey was conducted in the Upper Waimata Valley, East Coast, New Zealand. The survey, comprising 122 Five Minute Bird Counts across four properties, aimed to monitor the impact of predator control on bird populations within the Waimata Catchment Restoration Project area.

The Waimata Catchment covers 226 km^2, and the Waimata Catchment Restoration Project has a focus on restoring biodiversity, particularly native bird species, through predator control and habitat enhancement. The area's diverse vegetation—ranging from pasture to native bush—provides a wide range of habitat for a variety of bird species.

Key Findings:

- A total of 1,467 birds were observed in 2024, compared to 1,646 in 2023. The number of species recorded decreased from 41 in 2023 to 37 in 2024.
- There was no statistically significant change in the mean number of birds observed, though there was a notable increase in species diversity, with the mean number of species identified per station rising significantly.
- Species showing significant increases include Shining Cuckoo, Bellbird, Skylark, and Chaffinch. Notable decreases were observed in the Australasian Harrier.
- The arrival of the Canada Goose raises concerns about their potential impacts on ecology and farm production.

Discussion: The predator control efforts began in 2022 and may have contributed to some species' recovery, especially those like Bellbird and Shining Cuckoo that are vulnerable to rat predation. However, cyclones in 2023 likely disrupted bird populations, and changes in the data may reflect a return to normal post-cyclone conditions.

Conclusion: Predator control appears to have had a positive effect on some native bird populations. Future surveys will provide clearer insights into long-term trends and the full impact of ongoing management efforts.

Introduction

The Waimata River Catchment covers 226 km^2 on the East Coast of the North Island of New Zealand.
The Waimata Catchment Restoration Project was formed in 2019 and among other goals aims to restore:

"Biodiversity in the wider catchment – with a focus on increasing the prevalence of native bird species, but also strengthening habitat values for other native fauna such as bats and herpetofauna.
• Controlling predators of native birds and fauna (rats, mustelids, possums, cats) and developing a Predator Free initiative
• Improving the health of existing native bush in the catchment by reducing browsers (goats, deer, possums), weed control, planting buffers and connecting bush areas together to increase their resilience
• Connections to other ecological initiatives such as Whaia Titirangi with the potential to develop a biodiversity corridor from the top of the catchment to Titirangi maunga. As well as supporting sustainable land management and economic uses within the catchment."

Current vegetation cover
The Upper Waimata catchment is primarily steep pasture with sheep and beef farms covering much of the land. This farmland contains numerous ponds, many of which are artificial dams used for stock water, while some are naturally occurring. There are also wetlands, with the majority of these being on Monowai Station. There are also significant areas of plantation forestry.

In the upper catchment, steep slopes, gullies, and waterways have often been planted with willows and/or poplars. These are often mixed with some native vegetation with some riparian areas being almost entirely native vegetation.

There are also remnant areas of indigenous forest. These are often small and generally don't have many emergent trees presumably due to previous logging of mature podocarps. These are often Pukatea, Kahikatea, Rimu, and Black Beech over a Tawa/Kohekohe canopy.

There are extensive areas of Mānuka and Kānuka, especially on Hiwiroa Station.

There are occasional small stands of old large Macrocarpa, Eucalyptus trees, or Pinus Radiata, either growing together or singly.

Pasture on flat or easy country ranges from recently sown improved pasture with a diverse species mix to rougher damp flats with rushes.

Hill country pasture, in addition to exotic grasses, often has a mix of weeds, and intentionally planted broadleaf species such as clover and plantain. There are rushes in seeps, and occasional Kānuka/Mānuka.

This highly varied mosaic of habitat provides excellent cover, food, and nesting opportunities for a wide range of bird species.

This study aims to investigate trends in bird populations within the Upper Waimata catchment by repeating the 2023 data collection in 2024, and comparing the results, and exploring potential reasons for these observed trends.

Methods

In November and December 2024, 5 minute bird counts were carried out at the 122 listening stations* established across 4 farms in the upper Waimata catchment in 2023 (appendix i).

*(123 stations were set up in 2023 however only 122 were used in 2024 due to a mapping error. Station 412 was not surveyed in 2024 due to a mapping error, and its 2023 data was excluded from all analyses.)

5 Minute Bird Counts were carried out using the standard five-minute bird count (5MBC) methodology (Dawson and Bull 1975) with some minor modifications described below.

In 2023 a pragmatic, accessible route through the farm was planned then walked, and every 200m along this path a 5MBC station was established. The predetermined path attempted to maximize the habitats covered while staying out of areas with very difficult access. Wetlands and ponds were surveyed whether they were 200m from the previous station or not. This resulted in 3 stations being 140,150, and 160m from their nearest station. Similarly, to capture bird species in remnant areas of bush, the distance between stations was on two occasions extended to 220 and 240 metres.

When approaching wetlands and ponds, any birds that left on approach were included in the count. The 5-minute timer was started from when they flew off.

Birds were identified at whatever distance they were heard or seen (rather than at a 200m limit as per the Dawson and Bull methodology).

“Merlin Bird Identification” app was used as the five-minute timer and for confirmation of calls of some species. At this stage, it cannot identify many New Zealand bird calls, so it cannot be relied on heavily for this work but is useful for confirming European species.

Binoculars were used to identify birds seen rather than to search for birds.

Bird counts were conducted only on “normal early summer days”, characterized by fine weather without rain, extreme wind, or extreme temperatures.

Birds were identified from both sight and sound. External factors that could affect bird detection included wind noise in trees, the mooing of cattle, road traffic (logging and gravel trucks), aircraft, the sound of flowing water, and in one case, the loud calls of paradise ducks at close range made it difficult to hear other species.

Distinguishing between Grey Ducks, Mallards, and Grey/Mallard hybrids was not possible in 2024. These require clear observation of beak, wing, and feet for species differentiation. In 2023,

individuals appearing to be Grey Ducks were clearly identifiable. In 2024, only flying individuals of these species were seen, therefore, they were grouped together as “Grey Duck/Mallard” .

Data were collected on the total number of birds observed, the number of species recorded, and the specific species present each year.

A paired t-test was used to compare the mean number of birds observed at each listening station between 2023 and 2024. The mean number of species recorded at each station for both years was also compared using a paired t-test. Statistical analyses were conducted to determine whether changes in bird numbers and species diversity were significant ($p<0.05$) between the two years.

Species lists were compiled to identify species observed in 2023 but not in 2024 and vice versa, highlighting shifts in species composition between the two years.

Results

A total of 1646 birds were observed in 2023, while 1467 birds were observed in 2024.

In 2023, 41 species were recorded, whereas in 2024, 37 species were recorded. Species names in English, Māori, and Latin are recorded in appendix ii.

Birds observed in 2023 but not in 2024 included Black Shag, Pukeko, Tomtit, Cirl Bunting, Spotless Crake, and New Zealand Falcon. Species seen in 2024 but not in 2023 were Canada Goose, Dunnock, and Pied Stilt.

The mean number of birds observed at each listening station was higher in 2023 (M = 13.38, SD = 19.86) than in 2024 (M = 11.93, SD = 7.14). However, the difference was not statistically significant (t = 0.876, p = 0.38, two-tailed). (Fig 1).

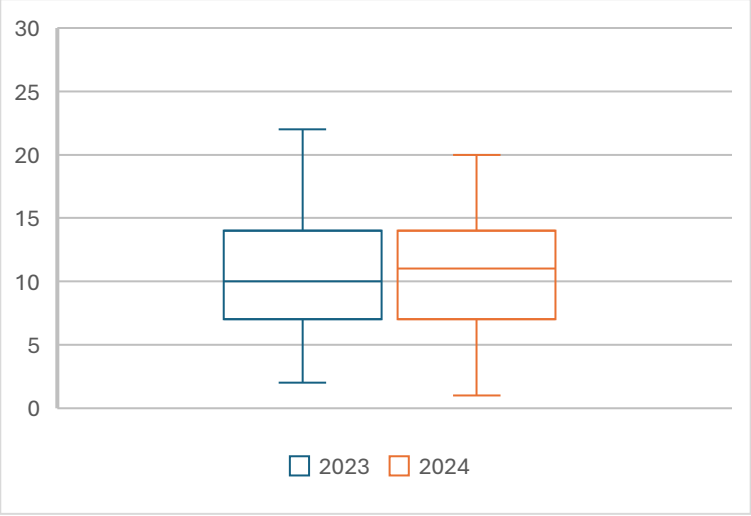


Fig.1 Number of individual birds seen or heard at each station (outliers not shown in graph)

The mean number of species at each station increased significantly from 2023 (M = 6.73, SD = 2.52) to 2024 (M = 7.31, SD = 2.59; t = -2.205, p = 0.029) (Fig 2.)

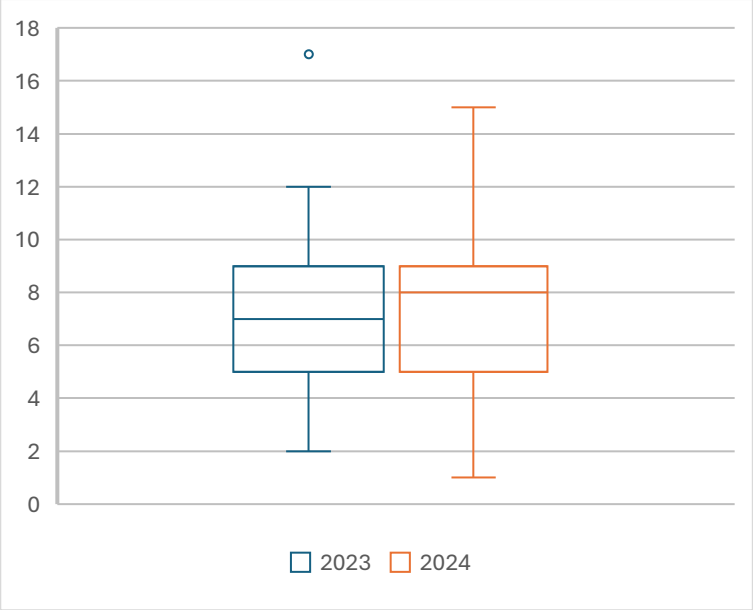


Fig 2 The number of species seen or heard at each station

	2023 Total	2024 Total	% change	t test
Cuckoo, Shining	12	32	166.67%	0.0018
Bellbird	1	18	1700.00%	0.0027
Dunnock	0	6		0.0137
Skylark	41	56	36.59%	0.0215
Harrier, Australasian	32	16	-50.00%	0.0259
Chaffinch	91	117	28.57%	0.0431
Goose, Canada	0	8		0.045
Yellowhammer	49	73	48.98%	0.0481
Tui	91	66	-27.47%	0.0527
stilt, pied	0	6		0.0575
Duck, (Grey or Mallard)	67	33	-50.75%	0.0602
Tomtit, Nth Is	2	0	-100.00%	0.1581
Thrush, Song	12	19	58.33%	0.1624
Warbler, Grey	82	69	-15.85%	0.1787
Shag, Black	3	0	-100.00%	0.1808
Sparrow, House	87	65	-25.29%	0.1833
Plover, Spur-winged	88	29	-67.05%	0.1885
Swallow, Welcome	25	38	52.00%	0.2058
Peafowl (peacock/peahen)	40	31	-22.50%	0.2089
Kingfisher, NZ	62	50	-19.35%	0.2363
Fantail, Nth Is	40	51	27.50%	0.2505
Turkey	45	66	46.67%	0.2974
Bunting, Cirl	1	0	-100.00%	0.3193
Crake, Spotless	1	0	-100.00%	0.3193
Falcon, NZ	1	0	-100.00%	0.3193
Pukeko	2	0	-100.00%	0.3193
Teal, Grey	35	14	-60.00%	0.3215
Shelduck, Paradise	87	60	-31.03%	0.3259
Pheasant	62	54	-12.90%	0.334
Starling	204	87	-57.35%	0.441
Swan, Black	1	4	300.00%	0.4691
Heron, White-faced	14	6	-57.14%	0.4817
Gull, Southern Black-backed	58	71	22.41%	0.5408
Silvereye	42	49	16.67%	0.5658
Greenfinch	17	21	23.53%	0.6015
Magpie, Australian (magpie sp.)	103	111	7.77%	0.6046
Pigeon, NZ/Kereru/Kupapa	9	7	-22.22%	0.6191
Dabchick, NZ	3	2	-33.33%	0.6566
Goldfinch	62	56	-9.68%	0.67
Blackbird	49	52	6.12%	0.7372
Whitehead	8	7	-12.50%	0.7404
Goose, Feral/ Domestic	1	1	0.00%	1
Myna, Indian	16	16	0.00%	1

Table 1 Percentage change in total of each species observed in 2023/24. Sorted by significance , highlighted species had a significant change ($p<0.05$, 2 tailed paired t-test)

Discussion

The predator control in the Waimata started in March 2022. The following spring the catchment was hit by Cyclones Hale (Jan 2023) and Gabrielle (Feb 2023). These would have had a significant impact on both mammalian pest and bird populations. Changes in 5MBC bird count data between 2023 and 2024 may show the influence of trapping, a change in populations after these cyclones, or influence of other unconsidered factors.

As noted in the 2023 report, 5MBC provides an index of the likelihood of detecting a species rather than a census of bird numbers. For example, while 54 pheasants and seven kererū were observed in 2024, this doesn't indicate there are eight times as many pheasants as kererū but rather that pheasants are eight times more likely to be detected at the study site.

Species present in counts in 2023 not recorded in 2024

Black Shag – A single Black Shag was seen in 2024 flying up the valley; however, it was not seen during a 5-minute count.

Pūkeko were not seen at all but have been observed on Monowai Station recently.

Tomtit were not heard or seen during a count but were spotted between listening stations close to where they were recorded in 2023.

Cirl Bunting were not recorded in the 2024 survey. If present, these would be in very low numbers. Spotless Crake were not detected. Calls were played at all wetlands visited on Watson's farm, but no response was heard. Crake can move around and are also very difficult to detect. More work could be done to confirm the presence of this species.

New Zealand Falcon were not heard or seen during this survey. Matt Bailie mentioned having seen one recently, so they are still in the valley. New Zealand Falcon home ranges can be up to 200 sq km, and the Waimata catchment is 226 sq km, so there may only be one pair in the upper catchment.These anecdotes suggest the species that were recorded in 2023 but not 2024 are likely still present and their absence from the 2024 records does not represent an ecological change.

Species not recorded in 2023 present in 2024

Canada Goose – These were recorded on the Hall Property and apparently have moved into the valley in the last year.

Pied Stilt – While not recorded in 5MBC in 2023, these were mentioned as being occasionally seen by landowners, so it was no surprise to record them in 2024.

Dunnock – These were likely present in the survey area in 2023 but not detected. They have been recorded on Hall's property in the past (M. Rutherford, pers. obs.).

The only change of concern is the Canada Goose. In other places on the East Coast (Whakaki, Nuhaka, Ruatoria) numbers of these have increased into the hundreds (G. Atkins & M. Rutherford,

pers. obs.). Where numbers are high on farmland, they compete for grass with stock and can foul the ground, and consequently, control through hunting and culling has been carried out (Spur 2005).

Changes in individual species numbers

Table 1. shows there were seven species that had a significant increase in number ($p<0.05$). These were Shining Cuckoo, Bellbird, Dunnock, Skylark, Chaffinch, Canada Goose, Yellowhammer.

As discussed Canada Goose numbers are increasing in the region, therefore their increase cannot be attributed to any catchment management actions.

Shining Cuckoo and Bellbird are native species that rely on safe nesting conditions. Ship Rats and Stoats are the most likely to decrease breeding success of these species. Norway rats may also impact them. While at a lower trap density than recommended for suppression of rat numbers, the trapping may be contributing to the increase in these species. It could also be that they were more impacted by the 2022 cyclones, and the increase is a recovery from this event.

Shining Cuckoo not only lay eggs in Grey Warbler nests, but adult Shining Cuckoo also evict nestlings of Grey Warbler. The reason for this may be to force warbler pair to renest increasing the chance the adult Shining Cuckoo can lay eggs in the new nest (Beauchamp, 2017). This study shows a reduction in Grey Warbler numbers which while not statistically significant ($p=0.18$) is worth noting, and if this study is repeated a trend might be seen showing a negative correlation between Shining Cuckoo and Grey Warbler numbers.

Dunnock nest in dense shrubs quite close to the ground. Yellowhammer are similar in their choice of nesting sites. Skylark nest on the ground while Chaffinch nest higher in trees. These increases may be due to a reduction in stoat and hedgehog numbers through pest control. This is especially true in the case of the ground nesting Skylark (Thomsen 2002)

There are a wide range of possible reasons for a decrease in the Harrier population ranging from decreased pest animals to feed on, to land owner control of this species seen by some be a pest.

It should be noted that the 2023 observations were during the first breeding season after Cyclone Gabrielle and Cyclone Hale hit the study region in early 2023. This may mean the 2023 bird numbers were at unusual levels and change may be a return to a more normal state, rather than a change from a normal state.

Future observations will help in determining whether these changes are long term trends.

References

Barea, L., Waas, J., & Thompson, K. (1997). Nest site characteristics of New Zealand falcons (Falco novaeseelandiae) in a forested habitat. *Notornis, 44*, 213–218.

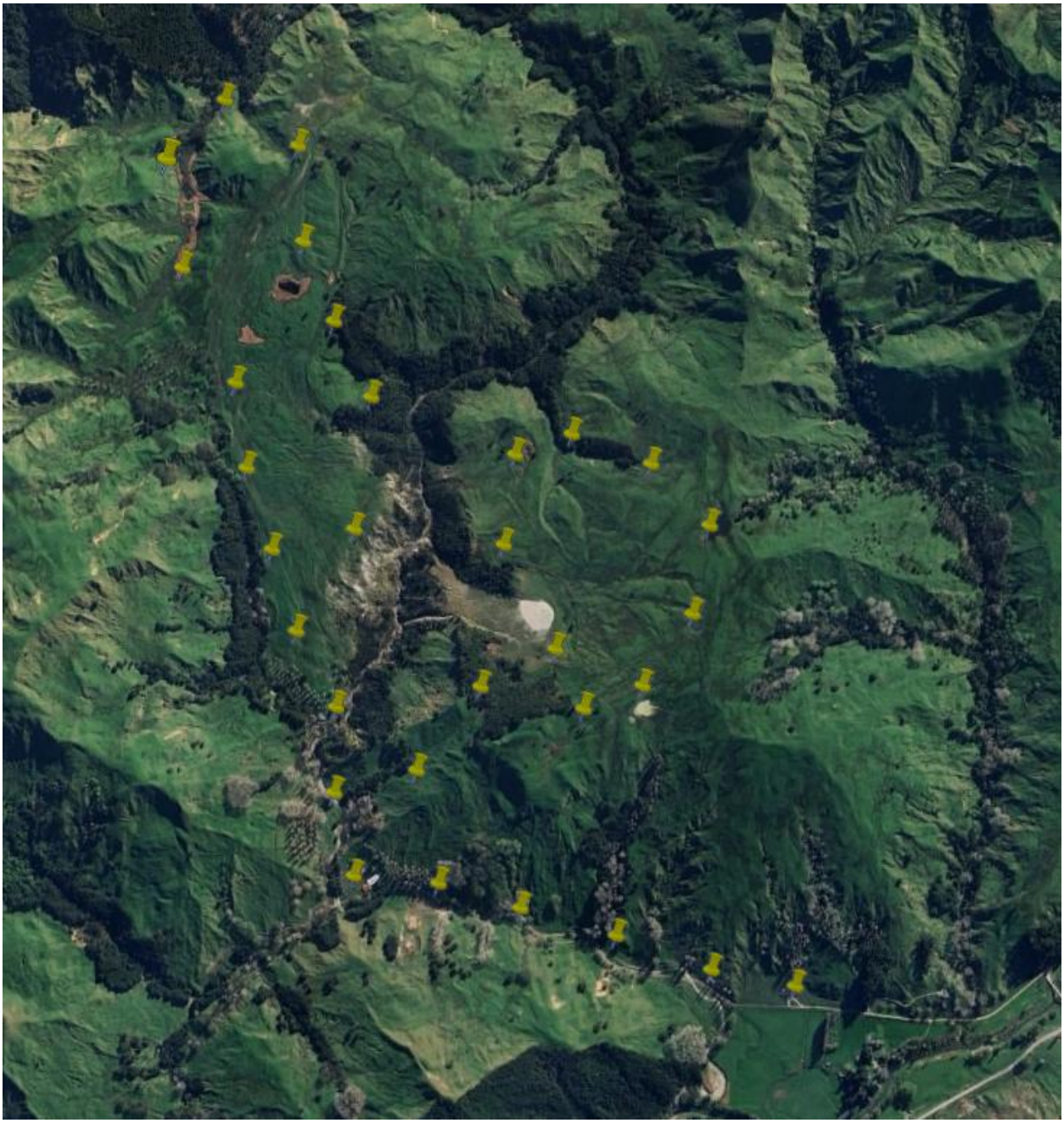
Beauchamp, A. J. (2017). Multiple young shining cuckoos (Chrysococcyx lucidus) being fed by single grey warbler (Gerygone igata) pairs. *Notornis, 64*, 102–105.

Spurr, E. B., & Coleman, J. D. (2005). *Review of Canada goose population trends, damage, and control in New Zealand*. Manaaki Whenua Press.

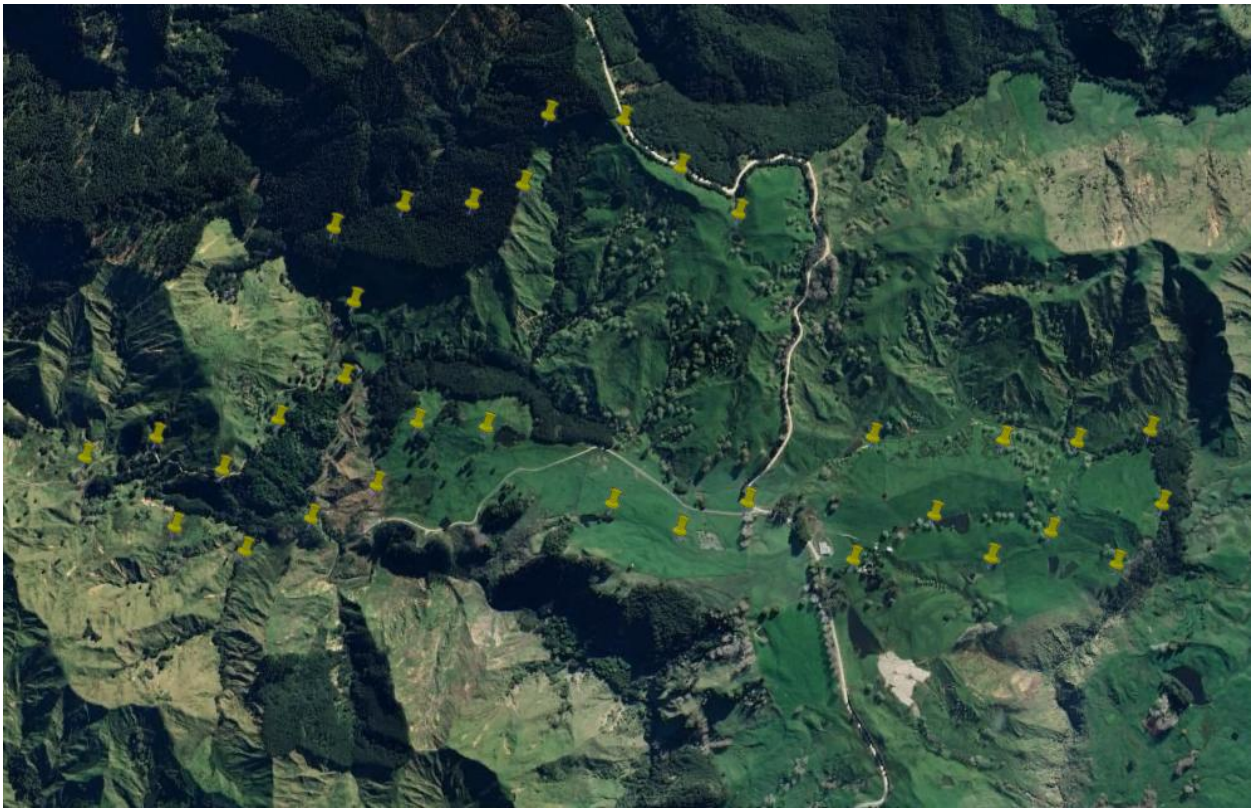
Thomsen, S. (2002). *The ecology of the skylark (Alauda arvensis L.) on the Canterbury Plains, New Zealand* (Doctoral thesis, Lincoln University).

Appendix i - Mapped locations of listening stations in the Upper Waimata

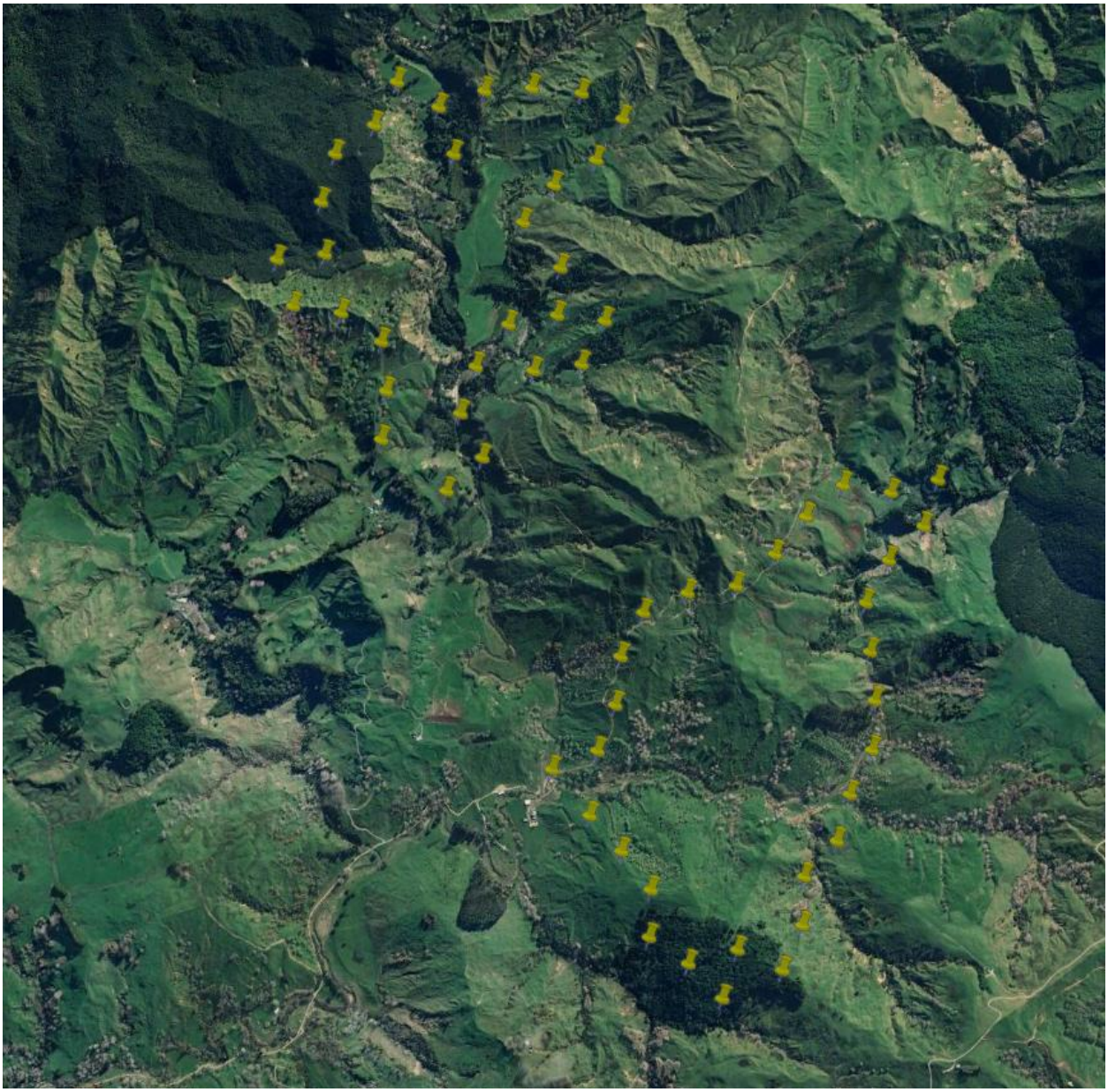
Context of listening stations in the region



Survey points on Monowai Station (Watsons)



Survey Points on Kaharoa Station (Halls)



Survey Points on Kowhai Station (Uttings), and Hiwiroa (Bailies)

Appendix ii

Scientific names of birds of the Upper Waimata ordered alphabetically by common name

Common Name	**Māori Name**	**Latin Name**
Bellbird	Korimako	*Anthornis melanura*
Bunting, Cirl	-	*Emberiza cirlus*
Chaffinch	-	*Fringilla coelebs*
Crake, Spotless	Pūweto	*Zapornia tabuensis*
Cuckoo, Shining	Pīpīwharauroa	*Chrysococcyx lucidus*
Duck Mallard	-	*Anas platyrhynchos*
Duck, Grey	Pārera	*Anas superciliosa*
Dunnock	-	*Prunella modularis*
Falcon, NZ	Kārearea	*Falco novaeseelandiae*
Fantail, Nth Is	Pīwakawaka	*Rhipidura fuliginosa*
Goose, Canada	-	*Branta canadensis*
Greenfinch	-	*Chloris chloris*
Gull, Southern Black-backed	Karoro	*Larus dominicanus*
Harrier, Australasian	Kāhu	*Circus approximans*
Heron, White-faced	Matuku	*Egretta novaehollandiae*
Kingfisher, NZ	Kōtare	*Todiramphus sanctus*
Magpie, Australian	-	*Gymnorhina tibicen*
Peafowl	-	*Pavo cristatus*
Pheasant	-	*Phasianus colchicus*
Plover, Spur-winged	-	*Vanellus miles*
Pukeko	Pūkeko	*Porphyrio melanotus*
Shag, Black	Kawau	*Phalacrocorax carbo*
Shelduck, Paradise	Pūtangitangi	*Tadorna variegata*
Silvereye	Tauhou	*Zosterops lateralis*
Skylark	-	*Alauda arvensis*
Sparrow, House	-	*Passer domesticus*
Starling	-	*Sturnus vulgaris*
Stilt, Pied	-	*Himantopus leucocephalus*
Swallow, Welcome	-	*Hirundo neoxena*
Swan, Black	-	*Cygnus atratus*
Teal, Grey	Tētē	*Anas gracilis*
Thrush, Song	-	*Turdus philomelos*
Tomtit, Nth Is	Miromiro	*Petroica macrocephala*
Tui	Tūī	*Prosthemadera novaeseelandiae*
Turkey	-	*Meleagris gallopavo*
Warbler, Grey	Riroriro	*Gerygone igata*
Yellowhammer	-	*Emberiza citrinella*
Pigeon, NZ/Kereru/Kūpapa	Kererū/Kūkupa	*Hemiphaga novaeseelandiae*
Dabchick, NZ	Weweia	*Poliocephalus rufopectus*
Goldfinch	-	*Carduelis carduelis*
Blackbird	-	*Turdus merula*
Whitehead	Pōpokotea	*Mohoua albicilla*
Goose, Feral/Domestic	-	*Anser anser*
Myna, Indian	-	*Acridotheres tristis*