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Te Whare Wānanga o Otāgo

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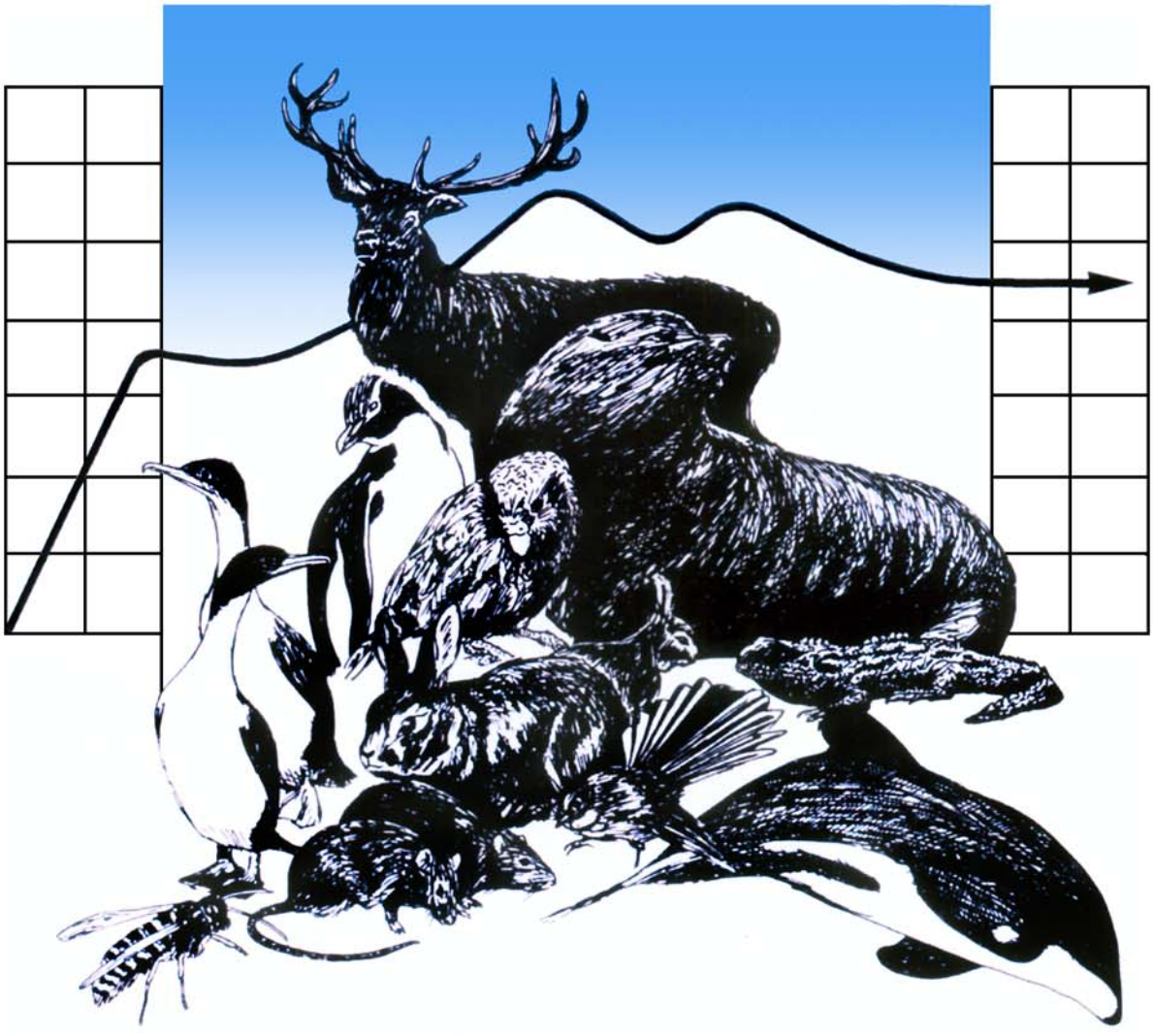
DEPARTMENT OF ZOOLOGY



WILDLIFE MANAGEMENT

Coal Island/Te Puka Hereka Mustellid Eradication.

Oliver Gansell

A research report submitted in partial fulfilment of the requirements of the Diploma in Wildlife Management

University of Otago

2006

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Coal Island/Te Puka Hereka Mustellid Eradication

Post Stoat eradication baseline monitoring, August 2005

Oliver Gansell

February 2006

Executive Summary

A mustellid eradication programme was initiated on Coal Island/Te Puka Hereka during the winter of 2005. The eradication of stoats on Coal Island was carried out by the Te Puka Hereka South-West New Zealand Endangered Species Charitable Trust, with the aim of creating an island sanctuary for rare species of indigenous flora and fauna.

Five minute bird counts were carried out over two days on Coal Island in August 2005 to gather baseline information by which the effect of the mustellid eradication on the local avifauna species may be measured in future years. Five minute bird counts are a method by which the relative abundance of avian species may be measured. Many variables affect the results of five minute bird count monitoring, such as weather and observer experience. It is important that these factors are taken into account during future analysis.

It would be useful for future monitoring to incorporate methodologies that measure the absolute abundance of avian species, such as distance sampling. Having comparative data from both absolute and relative abundance methodologies may help in gaining a clearer picture of the effect of removing/controlling mustellids from the Coal Island/Te Puka Hereka ecosystems.

Introduction

A mustellid eradication/ control programme was initiated on Coal Island/Te Puka Hereka during the winter of 2005. The eradication of stoats on Coal Island has been carried out by the Te Puka Hereka South-West New Zealand Endangered Species Charitable Trust. The eradication has been carried out using ground based trapping; using DOC 200 traps set in both wooden and wire tunnels. Traps are spaced every 100 metres on two lines, one ringing the island with the other running through the centre of the island. Additional trapping is also carried out on Steep-To-Island, Weka/Long Island and the adjacent mainland coastline within the known swimming distance of a stoat to Coal Island.

Coal Island is approximately 1100 ha in size. It is located in Preservation Inlet in between Kisbee Bay and Puysegur Point. The topography of the island is gently undulating from sea level to its high point at 251 metres asl. The vegetation on the island varies from coastal scrub dominated by muttonbird scrub (*Olearia spp.*) to lowland podocarp forest dominated by rimu (*Dacrydium cupressinum*), kamahi (*Weinmannia racemosa*) and southern rata (*Metrosideros umbellata*).

Control work for stoats was initiated during the winter of 2005. After six weeks of pre-feeding the traps were set, with 35 stoats caught within the trapped area, 21 stoats caught on the island, while the remainder were caught on the "stepping stone" islands and the adjacent mainland.

Baseline information was gathered directly after the initial trap checks, in order to monitor the presence and relative abundances of bird species on the island. If carried out regularly this information may be used in future years to assess how the avifauna species on the island respond to no or minimal numbers of stoats. The monitoring of the presence and relative abundances of bird species on the island was gathered using five minute bird counts. This was carried out by six students from the University of Otago's Postgraduate Diploma in Wildlife Management. This report documents the findings from the first five minute bird count survey carried out on Coal Island/Te Puka Hereka following the eradication of stoats from the island.

Observers:

Oliver Gansell, Vanessa Smith, Danillo Hegg, Megan Henderson, Pete Lee, Sera Kilduff.

Methods

Five minute bird counts were carried out using the methodology described by Dawson and Bull (1975). Five minute bird counts on Coal Island were carried out on three transects on two consecutive days. Additional transects were carried out on the adjacent mainland as a control. Transects were carried out in pairs to reduce observer bias affecting the data, and additionally transects were done by different pairs on different days to further reduce observer bias and account for some of the less experienced participants. All transects on Coal Island followed a bearing of 220^0 N. Five minute bird counts were carried out on Coal Island on the 27/28 of August 2005 with transects on the mainland being completed from Kisbee Bay on the 29 of August 2005.

Results

Coal Island Transects

Transect One

Day One

Station	GPS (Easting & Northing)	Species & (Number)
1	E2019340 N5436834	Fantail(1),G.warbler(1), Blackbird(1),Tomtit(1),Finch spp.(1)
2	E2019172 N5436910	G.warbler(1),Fantail(2),Tomtit(1),Bellbird(2)
3	E2018991 N5436983	Fantail(2),Tomtit(1),G.warbler(1)
4	E2018797 N5437057	B.creeper(10+),Tomtit(1),Fantail(3),Chaffinch(3),Bellbird(1),G.warbler(1),Silvereye(1)
5	E2018636 N5437116	Tomtit(1),G.warbler(2),Bellbird(1),Fantail(1)
6	E2018475 N5437172	Fantail(2),Bellbird(2),Rifleman(3+),G.warbler(1)
7	E2018283 N5437226	G.warbler(2),Tomtit(1), Bellbird(1), Chaffinch(1),Kaka(1)
8	E2018106 N5437297	B.creeper(10+), Chaffinch(1), G.warbler(1), Fantail(1), Tomtit(1),Kaka(1)
9	E2017928 N5437362	G.warbler(2), Fantail(1), Rifleman(1)
10	E2017762 N5437433	G.warbler(1),Fantail(),Tomtit(2),Bellbird(1), Chaffinch(1)

Day Two

Station	GPS (Easting & Northing)	Species & (Number)
1	E2019340 N5436834	Bellbird(2)
2	E2019172 N5436910	Tomtit(1),Bellbird(1),Fantail(3)
3	E2018991 N5436983	Tomtit(3),Bellbird(1)
4	E2018797 N5437057	Fantail(2),Bellbird(1),Tomtit(1),G.warbler(1)
5	E2018636 N5437116	Bellbird(2),Tomtit(1),Fantail(2)
6	E2018475 N5437172	Fantail(2),Bellbird(1),Tomtit(1),G.warbler(2),Kereru(1)
7	E2018283 N5437226	Fantail(1),Bellbird(2),Tomtit(2),G.warbler(3),Kereru(1)
8	E2018106 N5437297	G.warbler(1),Fantail(1),Bellbird(3),B.creeper(5+)
9	E2017928 N5437362	Fantail(1),Bellbird(2),G.warbler(2),Kereru(1)
10	E2017762 N5437433	Bellbird(1),G.warbler(1)

Transect Two

Day One

Station	GPS (Easting & Northing)	Species & (Number)
1	E2019515 N5436505	Fantail(2),B.creeper(5+),Tomtit(1),Bellbird(1)
2	E2019077 N5436599	G.warbler(2),Tomtit(2),B.creeper(1)
3	E2018887 N5436596	G.warbler(3),Tomtit(1),Fantail(2)
4	E2018689 N5436582	Fantail(1),Tomtit(1),G.warbler(1),Chaffinch(2)
5	E2018486 N5436560	Nil
6	E2018289 N5436572	Fantail(1), Chaffinch(1)
7	E2018084 N5436575	Bellbird(1)
8	E2017876 N5436573	G.warbler(1)
9	E2017697 N5436571	Bellbird(2)
10	E2017493 N5436597	Nil

Day Two

Station	GPS (Easting &	Species & (Number)

	Northing)	
1	E2019515 N5436505	G.warbler(2),Chaffinch(1),Bellbird(1)
2	E2019077 N5436599	Tomtit(1),Thrush(1),G.warbler(1),Chaffinch(1)
3	E2018887 N5436596	Bellbird(2),B.creeper(2),G.warbler(1),Fantail(1),Kereru(1)
4	E2018689 N5436582	Chaffinch(1),G.warbler(1),Tomtit(2),Bellbird(1),B.creeper(1)
5	E2018486 N5436560	B.creeper(8),G.warbler(1),Bellbird(1),Riflemen(3),Tomtit(1)
6	E2018289 N5436572	Bellbird(2),Fantail(2),G.warbler(1)
7	E2018084 N5436575	Tomtit(1),Bellbird(1)
8	E2017876 N5436573	Bellbird(1),G.warbler(2),Thrush(1),Tui(1),Tomtit(1),Chaffinch(5+
9	E2017697 N5436571	Bellbird(1),G.warbler(1), Fantail(1),Chaffinch(1)
10	E2017493 N5436597	B.creeper(10+),G.warbler(1),Chaffinch(1),Bellbird(3)

Transect Three

Day One

Station	GPS (Easting & Northing)	Species & (Number)
1	E2017960 N5435490	Fantail(1),Tomtit(1)
2	E2017753 N5435475	Bellbird(1),Tomtit(1),Blackbird(2)
3	E2017553 N5435453	Bellbird(1)
4	E2017350 N5435488	Kereru(2),Silvereyes(8+)
5	E2017154 N5435441	Fantail(2),Bellbird(2)
6	E2016953 N5435414	Kaka(2),G.warbler(1)
7	E2016716 N5435418	Fantail(2),Bellbird(3),G.warbler(2),Silvereye(5+)
8	E2016516 N5435393	Tui(2),G.warbler(2),Bellbird(3)
9	E2016303 N5435368	G.warbler(2),Bellbird(2),Fantail(1),Tomtit(1)
10	E2016123 N5435368	G.warbler(1),Bellbird(1)

Day Two

Station	GPS (Easting & Northing)	Species & (Number)
1	E2017960 N5435490	G.warbler(1)
2	E2017753 N5435475	Bellbird(3),G.warbler(2),Tomtit(1)
3	E2017553 N5435453	G.warbler(1),B.creeper(1),Bellbird(2)
4	E2017350 N5435488	G.warbler(1), Bellbird(2)
5	E2017154 N5435441	Thrush(1),B.creeper(4),Fantail(2),G.warbler(1),Tomtit(1),Bellbird(2),Silvereye(1)
6	E2016953 N5435414	G.warbler(1),Fantail(2),Bellbird(3),Tomtit(2)
7	E2016716 N5435418	Fantail(2),Bellbird(1),Chaffinch(2),G.warbler(1)
8	E2016516 N5435393	B.creeper(3),Bellbird(2),Tomtit(3),Fantail(2),Chaffinch(2),Silvereye(2),G.warbler(2)
9	E2016303 N5435368	Tomtit(1),B.creeper(4),Chaffinch(1),Kereru(1),Bellbird(1)
10	E2016123 N5435368	G.warbler(1),Bellbird(3),B.creeper(2),Fantail(1),Tomtit(1)

Mainland Transects

Transect One

Station	GPS (Easting & Northing)	Species & (Number)
1	E2025542 N5437122	Tomtit(1),G.warbler(1),Bellbird(1),Fantail(1),B.creeper(3)
2	E2025588 N5437304	Bellbird(4),Fantail(1),Tomtit(3),Blackbird(1),Chaffinch(1)
3	E2025681 N5437460	Fantail(1),Thrush(1),Bellbird(3),Tomtit(2),G.warbler(2),Riflemen(1)
4	E2025705 N5437627	G.warbler(2),Bellbird(2),Fantail(1),Tomtit(2),B.creeper(1)
5	E2025749 N5437784	Bellbird(3),G.warbler(1),Chaffinch(1),Tomtit(3),Rifleman(1),Kakariki(1)
6	E2025801 N5437801	Bellbird(1),G.warbler(3),Thrush(1)

7	E2025817 N5438151	Bellbird(2),Tomtit(1),G.warbler(2),Chaffinch(1),Riflemen(1)
8	E2025866 N5438328	Bellbird(3),B.creeper(3),Riflemen(1),G.warbler(1)
9	E2025926 N5438485	B.creeper(1),G.warbler(2),Fantail(2),Thrush(1)
10	E2025947 N5438623	Tomtit(2),Fantail(2),Bellbird(3),B.creepr(2),G.warbler(3),Kakariki(1)

Transect Two

Station	GPS (Easting & Northing)	Species & (Number)
1	E2024750 N5435246	Silvereye(1),G.warbler(1),Chaffinch(1),Bellbird(1)
2	E2024932 N5435348	Bellbird(1),G.warbler(2),Dunnock?(1)
3	E2025111 N5435450	Nil
4	E2025293 N5435550	G.warbler(2)
5	E2025449 N5435675	G.warbler(1),B.creeper(2)
6	E2025610 N5435799	Tomtit(2),G.warbler(2)
7	E2025756 N5435946	G.warbler(2),Bellbird(4),
8	E2025913 N5436065	Bellbird(4)

Transect Three

Station	GPS (Easting & Northing)	Species & (Number)
1	E2025280 N5436233	G.warbler(2),Bellbird(2),Tomtit(1),Chaffinch(1)
2	E2025138 N5436151	G.warbler(2),Tomtit(1),Chaffinch(1),Bellbird(2)
3	E2024937 N5436063	G.warbler(3),Bellbird(1),Tomtit(1)
4	E2024811 N5435976	G.warbler(3),Bellbird(1)
5	E2024685 N5435916	Chaffinch(3),Bellbird(2),G.warbler(1),Tomtit(1),Tui(1)
6	E2024521 N5435840	B.creeper(2),Fantail(1),G.warbler(3),Tomtit(1),Bellbird(1)
7	E2024394 N5435762	B.creeper(5),G.warbler(3),Tomtit(1)
8	E2024248 N5435680	G.warbler(2)
9	E2024087 N5435609	G.warbler(3),Fantail(1),Bellbird(1)
10	E2023954 N5435534	G.warbler(3),Bellbird(1)

Date	***Weather Summary***
27/08/05	Overcast with some rain, Southwest winds
28/08/05	Overcast with some rain, Southwest winds
30/08/05	Fine, sunny, light winds

Discussion

The five minute bird count technique is a measure of the relative density of avian species range and abundance. Five minute bird counts will provide an easily produced index for detecting changes in avian population numbers over time, but will not yield any information regarding absolute population numbers (Barraclough, 2000). If the same methodology is followed in subsequent monitoring trips to Te Puka Hereka/Coal Island it should be possible to detect changes in the relative abundance of bird species on Coal Island. However, there are certain weaknesses inherent in the five minute bird count technique. One of the major weaknesses of five minute bird counts is that they can be affected by many variables. For example, weather conditions affect birds activity as well as affecting the observers ability to see and hear birds (Dawson and Bull, 1975). Five minute bird counts are also affected by the experience and ability of the observer in detecting birds both visually and aurally. While conducting five minute bird counts on Coal Island we attempted to reduce the levels of observer bias by carrying out the transects in pairs, repeating the transects over the course of two days with different pairs on different transects. Levels of observer bias were further reduced by pairing some of the more experienced individuals with those with less experience. Future trips to Coal Island to repeat five minute bird counts should attempt as much as possible to replicate as many of these factors as possible i.e. using the same transects lines, at approximately the same time of year etc. In order to make the most of the opportunities to gather as much information as possible, it may be useful for future trips to also conduct monitoring using methodologies that test for absolute abundance i.e. Distance sampling. This does not necessarily entail a doubling of the monitoring effort as it can be incorporated into the same transect as five minute bird counts. Barraclough (2000) outlines in detail ways in which distance sampling can be incorporated into five minute bird counts. Monitoring for absolute abundance as well as relative abundance would provide a more well rounded picture of any population trends amongst the avian species of Coal Island now that stoats have been removed/controlled on Coal Island/Te Puka Hereka.

Additional ecosystem monitoring such as rodent monitoring (tracking tunnels), and herpetofauna and invertebrate monitoring would provide additional information by which the restoration of the Coal Island ecosystem may be measured. Future trips should allow for an extra day so that the transects on the adjacent mainland may be repeated. The author recommends that students from the post-graduate Diploma in Wildlife Management from the University of Otago continue to be involved in the

monitoring as it provides a valuable training experience, skilled field team and continuity in the monitoring effort.

The Te Puka Hereka South-West New Zealand Endangered Species Charitable Trust is to be commended for carrying out their work in what is a truly special part of New Zealand.

References:

Barraclough, R.K. 2000. Distance sampling. A discussion document produced for the Department of Conservation. SCIENCE AND RESEARCH INTERNAL REPORT 175.

Dawson, D.G., Bull, P.C. 1975. Counting birds in New Zealands forests. *Notornis* 22:101-109