



White-chinned petrels Auckland Islands

In part POP2014-02 Seabird population research
Presentation to the CSP Technical Working Group

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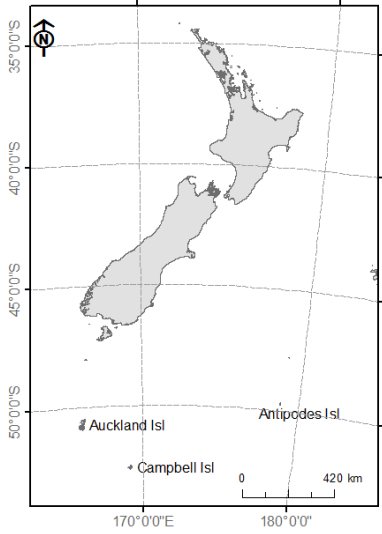




12 June 2015

Introduction

- White-chinned petrels incidental bycatch throughout range
- NZ breeding sites
- Broader NIWA-OU research programme
- Knowledge gaps



Bell EA (2014) Identification of seabirds captured in New Zealand fisheries: 1 July 2012 - 30 June 2013. Department of Conservation, Wellington

Sommer E, Boyle D, Baer J, Fraser MJ, Palmer D, Sagar PM (2010) Antipodes Island white-chinned petrel and grey petrel field work report, 2009-10. Unpublished final research report to Ministry of Fisheries. NIWA, Wellington

2

Objectives and status

Components relevant to CSP research objectives:

Project	CSP Objective	Stage
Population estimate Disappointment		Draft final results
Tracking	6C	In progress
Mark-recapture feasibility	6A	In progress
Population estimate Adams	6B	Methods

3

Disappointment population

Off main Auckland Isl

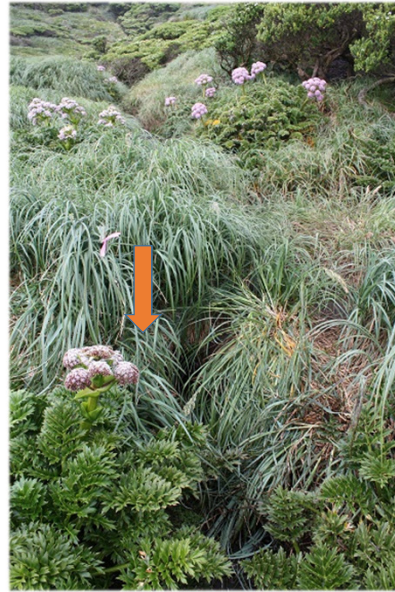
Taylor 1988: ~100 000 pairs

- 4 hrs

Walker, Elliot, McClelland, Robertson 1993

- 11 days





5

Disappointment: methods

31 December – 11 January 2015

4km² so randomised points

Detectability, line-transect distance sampling

Burrow occupancy



6

Disappointment: methods

Surface area from repeated slope measures

detection probability
burrow density
variances

} program Distance

N burrows and breeding population size

$$\hat{N}_{burr} = \hat{D} \times A \times b$$

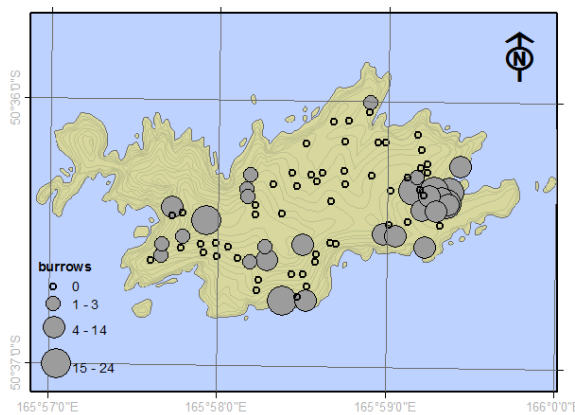
and

$$\hat{N}_{pairs} = \hat{N}_{burr} \times c$$



7

Disappointment: results



80 transects
2–50° slope
332 ha planar vs 395 ha surface

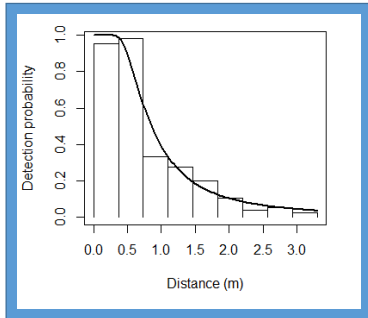
229 burrows on 35% of transects
Mean 8 (range 1–24) burrows

Mean white-chinned petrel burrows/line

Habitat	mean	SE	n
Megaherbs	5.88	1.87	16
<i>Poa foliosa</i>	4.88	1.40	24
Low open	0.83	0.61	12
<i>Poa litorosa</i>	0.32	0.20	22
Snow tuss scrub	-	-	6

8

Disappointment: results



Competing models for density of burrows

Area	Key function	Adj	Trunc	AIC	GOF	\hat{p}	SE (\hat{p})	CV (\hat{p})	\hat{D}	SE (\hat{D})	95% CI (\hat{D})
G	haz-rate	poly	2%	319.78	0.269	0.330	0.027	8.2	643.6	91.4	487.2–850.1
G	half-norm	cos	2%	320.76	0.111	0.323	0.019	6.0	657.5	85.6	509.2–849.0
G	uniform	cos	2%	323.07	0.044	0.332	0.018	5.5	638.2	81.8	496.3–820.7

Burrow occupancy January 2015

Inspected	158
Entrance not burrow	27
WCP burrows	131
Proportion burrows/entrances	0.8265 ± 0.037
Occupancy (occupied breeder/burrows)	0.73 ± 0.03

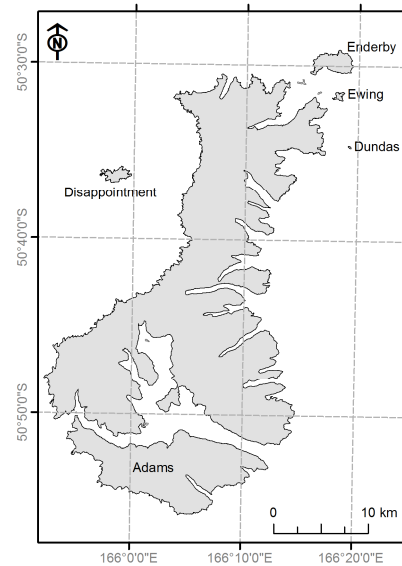
153 100 (115 900 – 202 200) breeding pairs

Disappointment: implications

Can't cf Taylor 1988 but quantitative baseline

High density and occupancy -> key site

Other breeding sites



Tracking

Objective: data on at-sea habitat use

Colony on Adams at Fairchild's Garden



11

Tracking

GLS on breeding white-chinned petrels

	deployed	retrieved
2013-14	22	-
2014-15	40	13
Total	62	??

- This coming season: 49 to find
- 60% recovery – 10% failure – ~ 33 datasets



12

Mark-recapture feasibility

Key demographic parameters

Is mark-recapture plausible?

- Burrows
- Occupancy
- Birds accessible
- Returns detected



13

Mark-recapture feasibility

- | | |
|------------------|---|
| Burrows | <input checked="" type="checkbox"/> |
| Occupancy | <input checked="" type="checkbox"/> 0.69 ± 0.05 occupancy |
| Birds accessible | <input checked="" type="checkbox"/> 50% of occ reachable, ~35% of burrows |

110 banded birds in 95 marked burrows

Returns detected **OK** 20/48 banded birds (42%)
recaptured 2014-15

Time **?** 2 seasons' data not sufficient



14

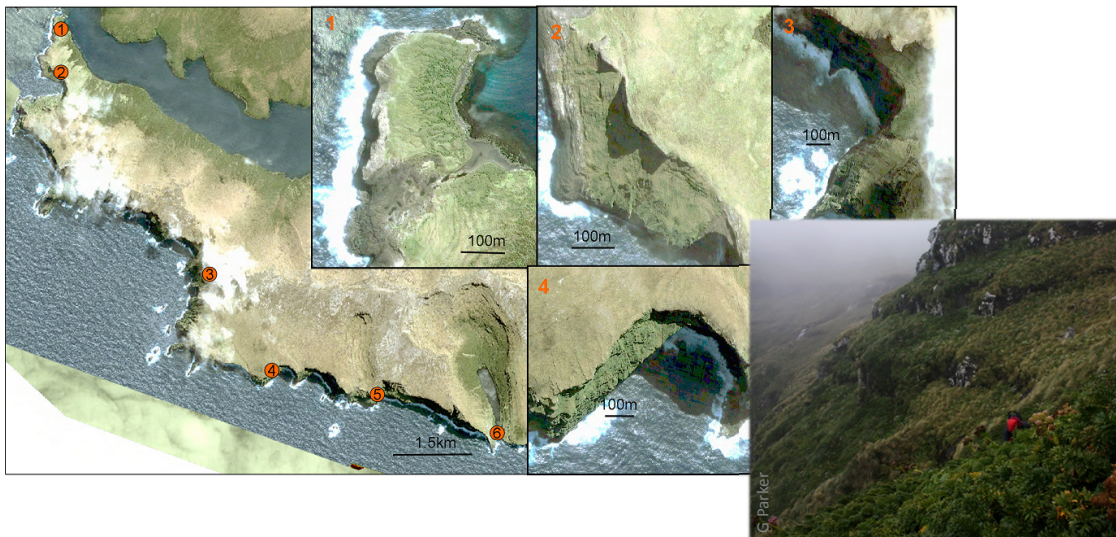
Mapping forward

Tracker retrieval 2015-16 season

Adams Island pop estimate: feasibility, methods



Adams survey: feasibility



Adams survey: methods

Burrow census (small ledges) or sample burrow numbers (large ledges)

Randomised point plots

146 aerial cliff habitat photos from Barry Baker



17

Adams survey: methods

Treat ledges as strata

Burrow occupancy

- ledges (spatial)

Survey other areas



18

Acknowledgements



Igor, Katie, DOC Southland team
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Baker & team photos
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Henk Haazen

