

Southern royal albatross at Enderby Island, Auckland Islands

Analysis of aerial photographs.



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background

- accurate estimation of numbers critical for determining conservation status of any animal
- aerial photography increasingly preferred as census method of choice for surface nesting seabirds, especially in remote locations (Wolfaardt & Phillips 2011)
- applied to a range of colonially nesting albatrosses BBA, WCA, SA, GHA
- Not yet tested on loosely colonial species

background

- Techniques developed involve:
 - low level flights;
 - sequential overlapping photos;
 - stitching to produce photo montages of colonies; &
 - direct counting

- Most great albatrosses (*Diomedea* spp) not highly colonial & nests widely dispersed:
 - not suited to survey using existing aerial techniques.

background

- Large distances between nests that are placed in essentially featureless topography pose challenges that may not be easily addressed through existing techniques
- effectiveness of aerial techniques needs to be tested for more dispersed species

Project aims

- test the suitability of aerial survey methods for counting breeding southern royal albatrosses on Enderby I.

Specifically:

- analyse series of photographs of SRA taken at Enderby Island in January 2013;
- assess suitability of aerial survey for SRA
- consider potential for monitoring other great albatross species, & other sites
- provide recommendations for further work to better assess the suitability of aerial methods
- provide recommendations for developing a standard aerial survey methodology for great albatross species

SRA background

—endemic NZ species

biennial breeder

—Campbell Island

8,300 – 8,700 pairs

Moore et al 2012

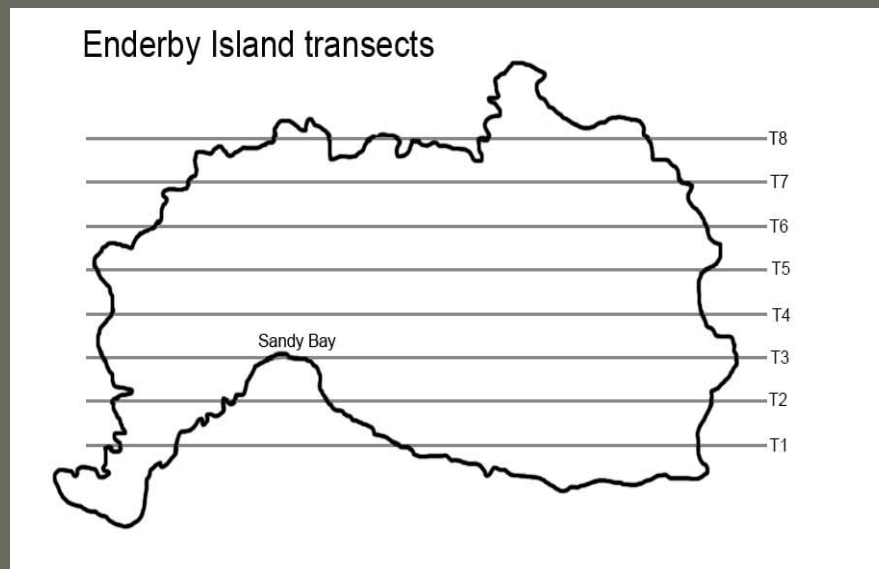
—Enderby Is, Auckland Islands

60 pairs

—both populations severely reduced during the farming era, now recovered

methods

- Enderby Island (50°30'S, 166°20'E)
small 710 ha, low lying, max elevation 45 m
- history of annual ground counts
- few series of 8 transects spaced at 200 m
running West to East



methods

- January 2013
 - mid incubation
 - chicks from previous year fledged
- aerial platform Squirrel Helicopter
- digital Nikon cameras & lenses
- based on photographic trials
 - D800 camera / 35mm lens / flight height 700 ft
- camera held facing downward at an angle of 70 degrees
- ensured plane of focus was as parallel to ground surface as possible without allowing the aircraft landing skid to appear in the camera viewfinder

Counting protocol & data assessment

- photomontages constructed of each transect
- no attempt to stitch adjoining transects
- paintbrush tool mark off counted birds
- all birds on the ground counted.
- each single bird assumed to represent breeding pair.
- all images counted by one observer only
- repeat counts by other observers desirable to test for observer bias in counting

ground counts

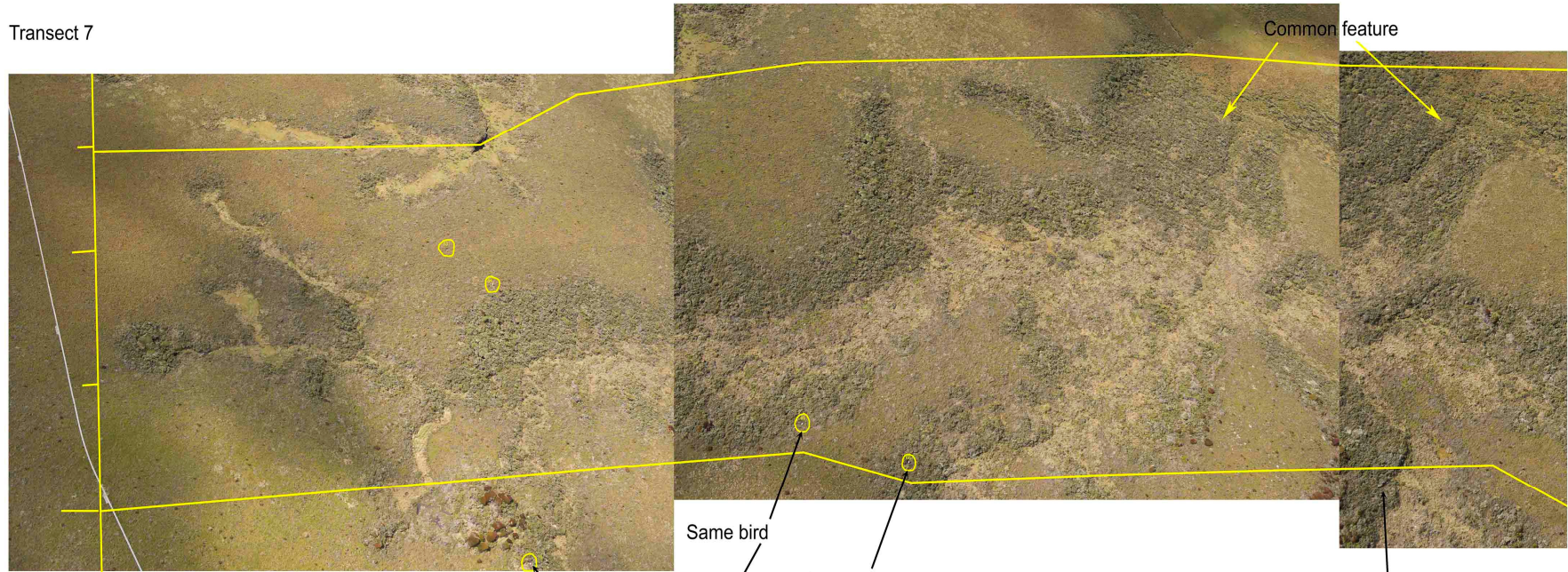
- Ground search of Enderby Is. late January within 1 week of aerial photography
- Search by 2-3 people walking 20 – 40 m apart
- Most of island searched
- Dense Rata forest not searched
- Location of all nests mapped & GPS

results

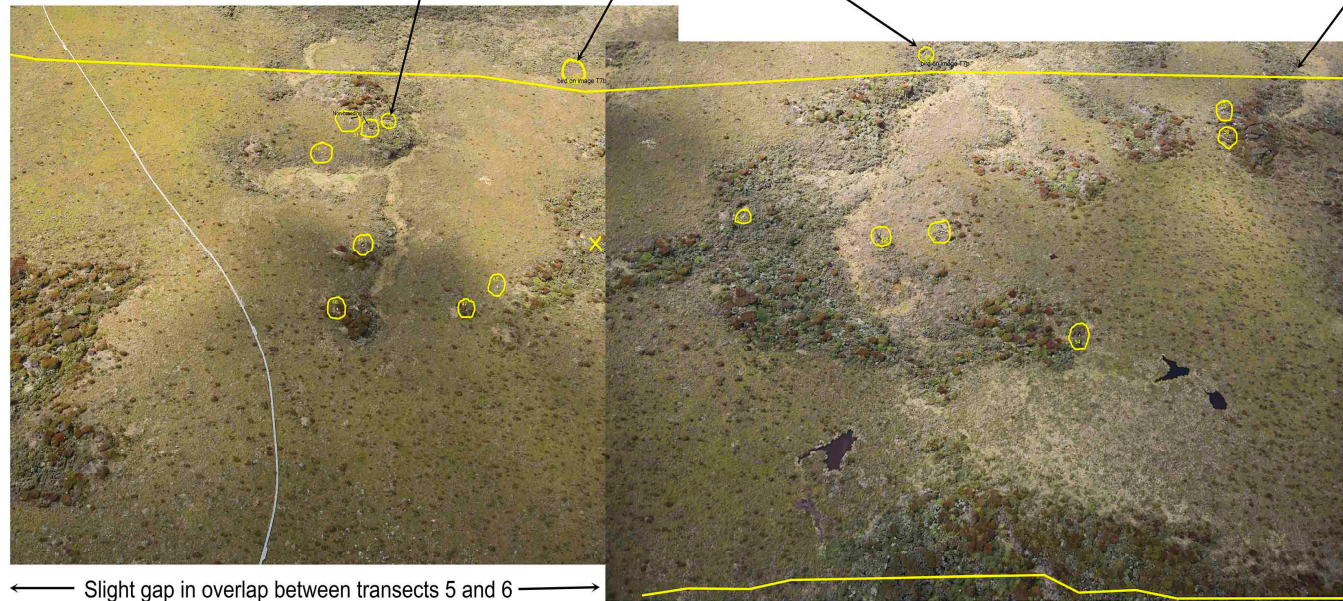
Aerial count	Ground count
54 nesting pairs	52 nesting pairs

- photo resolution adequate for purpose
- transect spacing / camera/lens extension/ flight height combo should have ensured slight overlap with adjacent transects
- generally achieved but coverage not complete across all transects
 - Pilot error – slight deviations in flight path?
 - Photographer error – insufficient care with framing?
- few birds missed

Transect 7



Transect 6



Same bird

Same bird

Common feature

Same bird

← Slight gap in overlap between transects 5 and 6 →

Nesting bird



Non-breeding birds



Nesting bird



Pair gamming



issues

- Stitching along transects easily achieved
- determining areas of spatial overlap between each transect time consuming & difficult at times
- parallax error - due to slight distortion between the top and bottom of each photograph

future work

- Refine technique for use with larger populations & colonies where spatial extent is greater
- Best done through use of randomised & stratified transects
- Will require accurate measurement of transect width (coverage) under defined camera / lens focal length / flight heights
- Maintain standard flight heights over variable terrain

Acknowledgements

Department of Conservation

- Igor Debski, Pete McClelland, Louise Chilvers

Southern Lakes Helicopters

- Mark Deaker

Blue Planet Marine

- Simon Childerhouse, Jacinda Amey, Anne McCrone, Derek Hamer
- Mark Holdsworth

Thank you