

# **Aerial counts of great albatrosses at Auckland Islands — 2014.**



**Barry Baker & Katrina Jenz**  
**Latitude 42 Environmental Consultants**

# 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 great albatrosses breeding the Auckland Islands
  - southern royal albatross on Enderby I.
  - Gibson's albatross on Disappointment I.

# Specifically:

- analyse series of photographs of SRA and GA taken in January 2014;
- assess suitability of aerial survey
- consider potential for monitoring other great albatross spp, & 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
- build on work undertaken on SRA in 2013

# 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

# Gibson's albatross

—endemic NZ species, biennial breeder

—Adams Is 3,159 annual pairs

Francis et al 2012

—Disappointment Is

352 annual pairs ACAP 2009

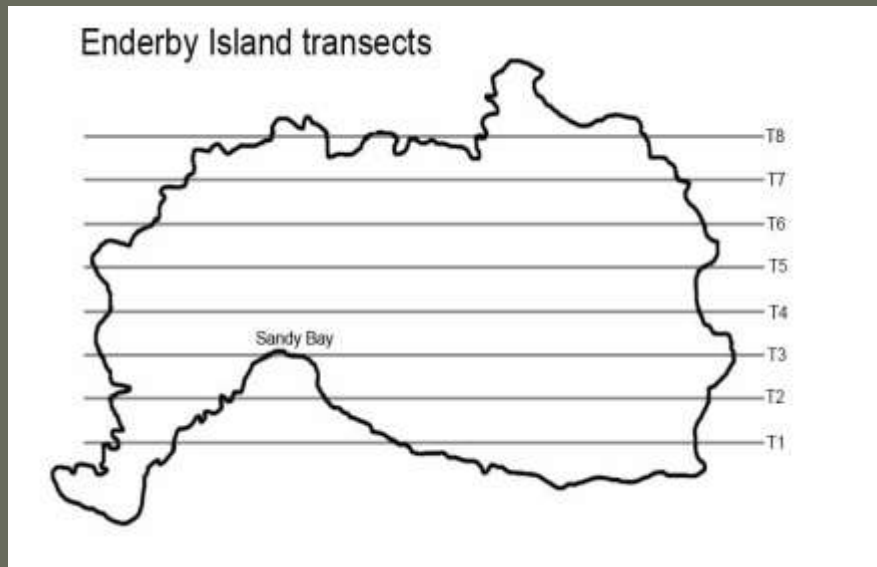
—Adams Is popn declined severely during 2000s





# 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

- Disappointment Island rises steeply from the sea to a plateau, elevation 400 m
- GA breed in areas of shrubland & fellfield on plateau
- rarely visited, no recent ground counts
- all suitable habitat on plateau photographed systematically in 12 sections



- timing January 2014
  - SRA mid incubation
  - GA end of egg-laying
  - chicks from previous year fledged
- aerial platform Squirrel Helicopter
- digital Nikon cameras & lenses
- SRA, based on photographic trials
  - D800 camera / 35mm lens / flight height 600 ft
  - camera held facing downward at an angle of 70 degrees
  - ensured plane of focus was as parallel to ground surface as possible
- Gibson's albatross
  - D800 camera, 70-200mm zoom lens, camera facing downward at angle of 45 degrees

# Counting protocol & data assessment

- photomontages constructed of each transect or area
- for SRA, 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 (assumes no observer bias in counting)

# ground counts

- **SRA only**
- Ground search of Enderby Is. late January  
3 week after 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
- **Gibson's albatross – no ground counts**

# SRA results

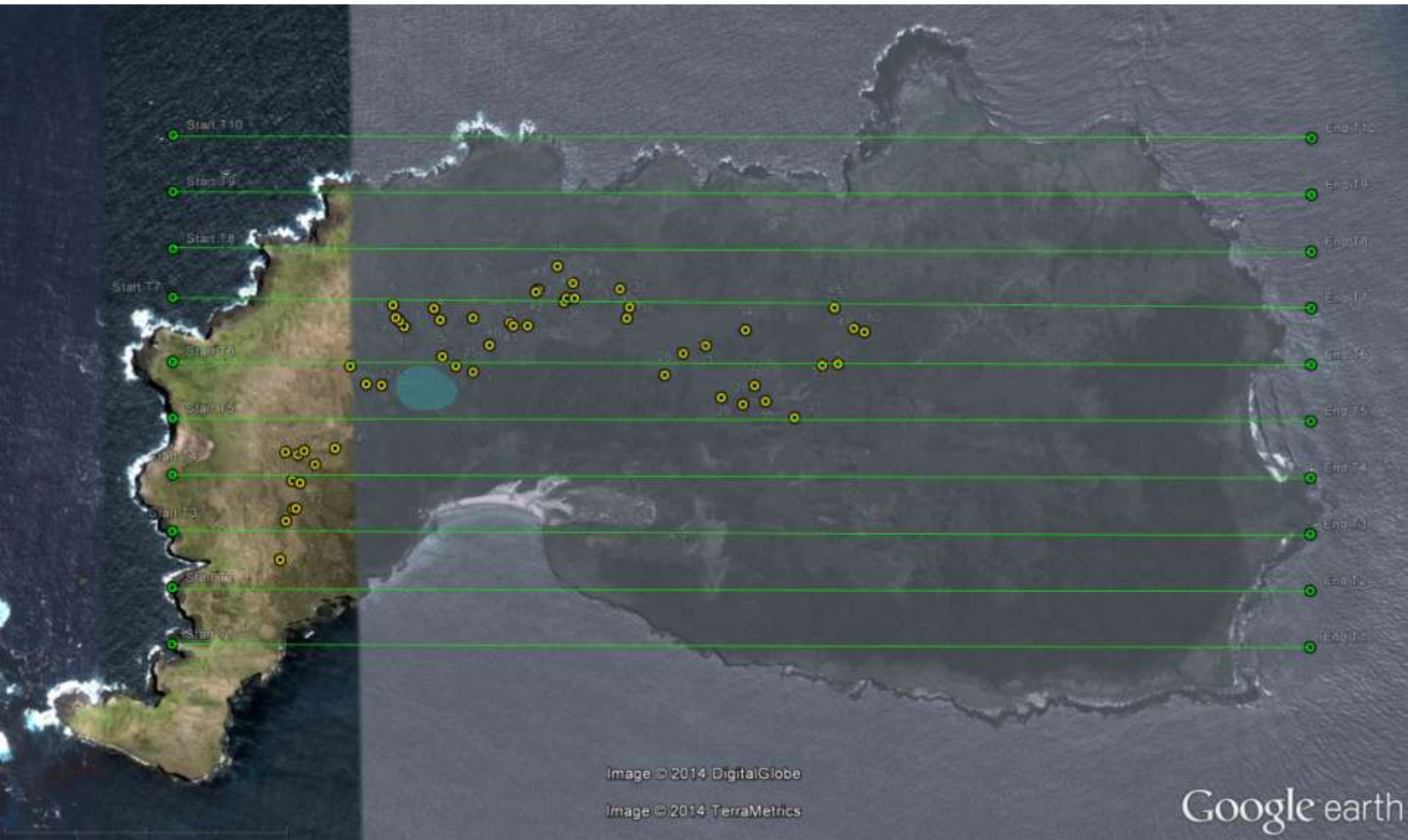
Aerial count	Ground count
63 nesting pairs	52 nesting pairs

—80 birds on transect montages

nesting	loafer	uncertain
44	12	24

—proportion nesting birds to all birds where status certain = 0.79

—few birds missed in aerial photos, but clear some birds were missed in ground count

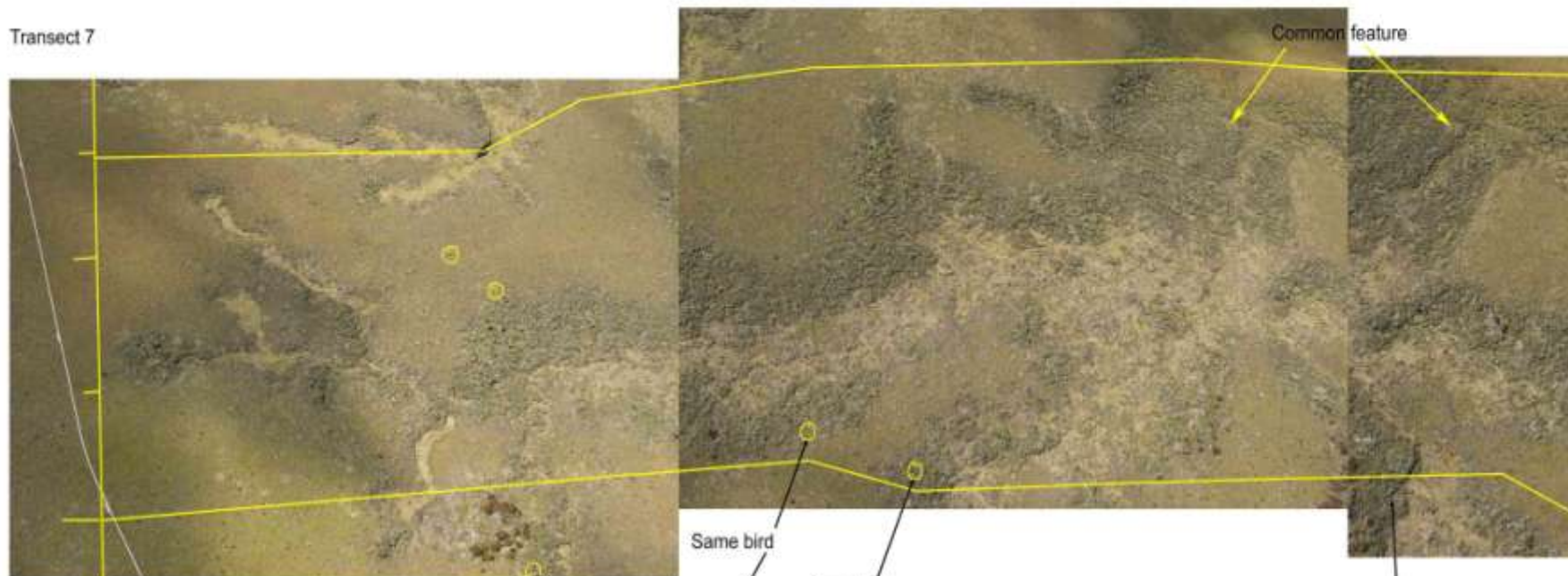


# SRA results

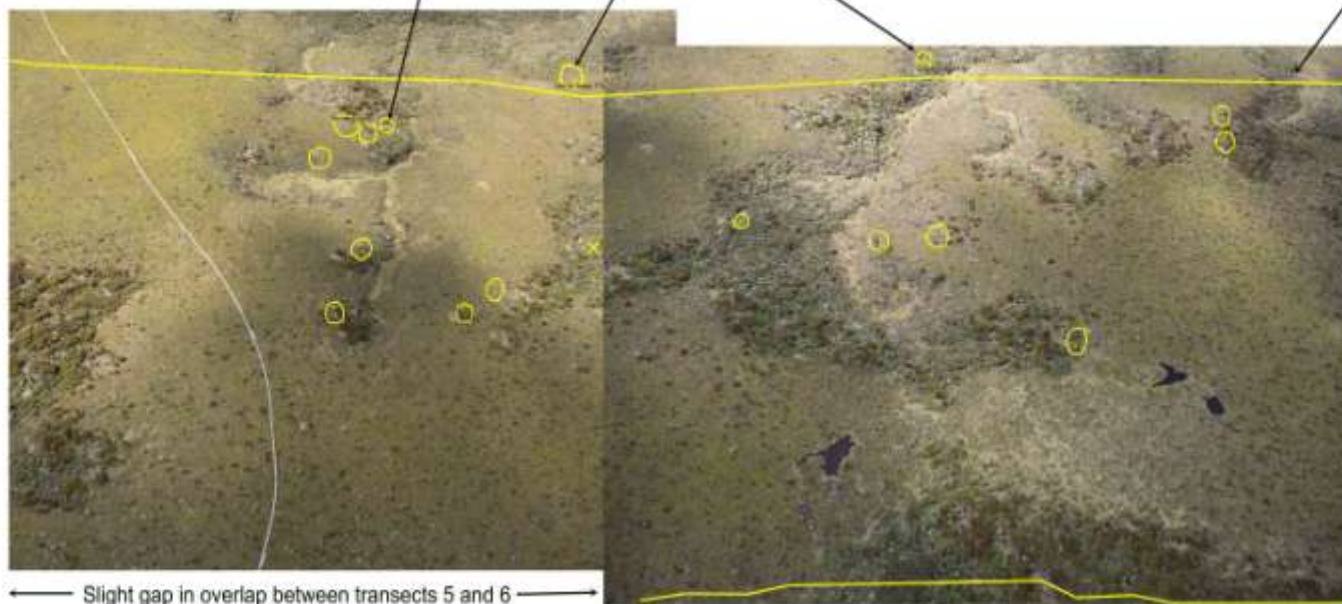
- photo resolution adequate for purpose, but not better than 2013.
- Raw files V fine jpeg files?
- transect spacing / camera/lens extension/ flight height combo should have ensured slight overlap with adjacent transects
- complete overlap achieved in only 40% of images, but not much missed
  - Pilot error – slight deviations in flight path?
  - Photographer error – insufficient care with framing?
- few birds likely to be missed - low colony density



Transect 7



Transect 6



← Slight gap in overlap between transects 5 and 6 →

Nesting bird



Non-breeding birds



Nesting bird



Pair gamming



# Gibson's albatross results

—452 birds counted on all photomontages  
(plus 11 partners of nesting birds)

nesting	loafer	uncertain
238	29	185

—proportion nesting birds to all birds where status certain = 0.89

—**estimate 403 annual breeding pairs**

—high number of birds classified as 'uncertain' because any nests obscured by surrounding vegetation

- Birds preferred nesting on ridgelines, not all plateau utilised



Area 12 - birds nested on ridge extending well below plateau<sub>20</sub>

Gibson's albatross nesting birds (left panel)  
with an extreme crop (right panel).



Gibson's non-breeding birds (left panel)  
with an extreme crop (right panel).



# Discussion – transects v areas

- **Transects preferred method for loosely colonial species**
- Stitching along transects easily achieved compared with stitching colony areas (ridge lines very time consuming with latter)
- Determining areas of spatial overlap between transects often difficult due to parallax error - distortion between the top & bottom of each transect

# photo prescriptions

- necessary to specify lens/camera/overflight height specification that has been field tested, and not rely on manufacturers gear specs to determine appropriate camera/lens combination
- theoretical calculations are hampered by inaccurate camera specifications
- Recommended specification for future survey of great albatross in Auckland Islands is a combination of:  
Nikon D800 camera /Nikkor 35mm lens/  
overflight height 600 feet:



# future work

- refine technique for use with larger populations & colonies where spatial extent is greater
- consider use of randomised & stratified transects for large areas
- undertake more work to accurately measure transect width (coverage) under defined camera / lens focal length / overflight heights
- Consider use of longer focal length telephoto lenses in addition to standard photos to take an adequate sample of 'close up' photos in future surveys. This will aid estimation of proportion of breeding & non-breeding birds in colonies

# future work

- ground truth Disappointment Island when the opportunity exists
- examine effect of time of day on presence of loafers in colonies to determine optimal time for aerial counts

# Acknowledgements

## Department of Conservation

Igor Debski, Pete McClelland, Louise Chilvers

## Southern Lakes Helicopters

Mark Deaker

## Blue Planet Marine

Simon Childerhouse, Sarah Michael, Nat Schmitt,  
Dave Donnelly, Andy Maloney

## Latitude 42

Mark Holdsworth

Thank you