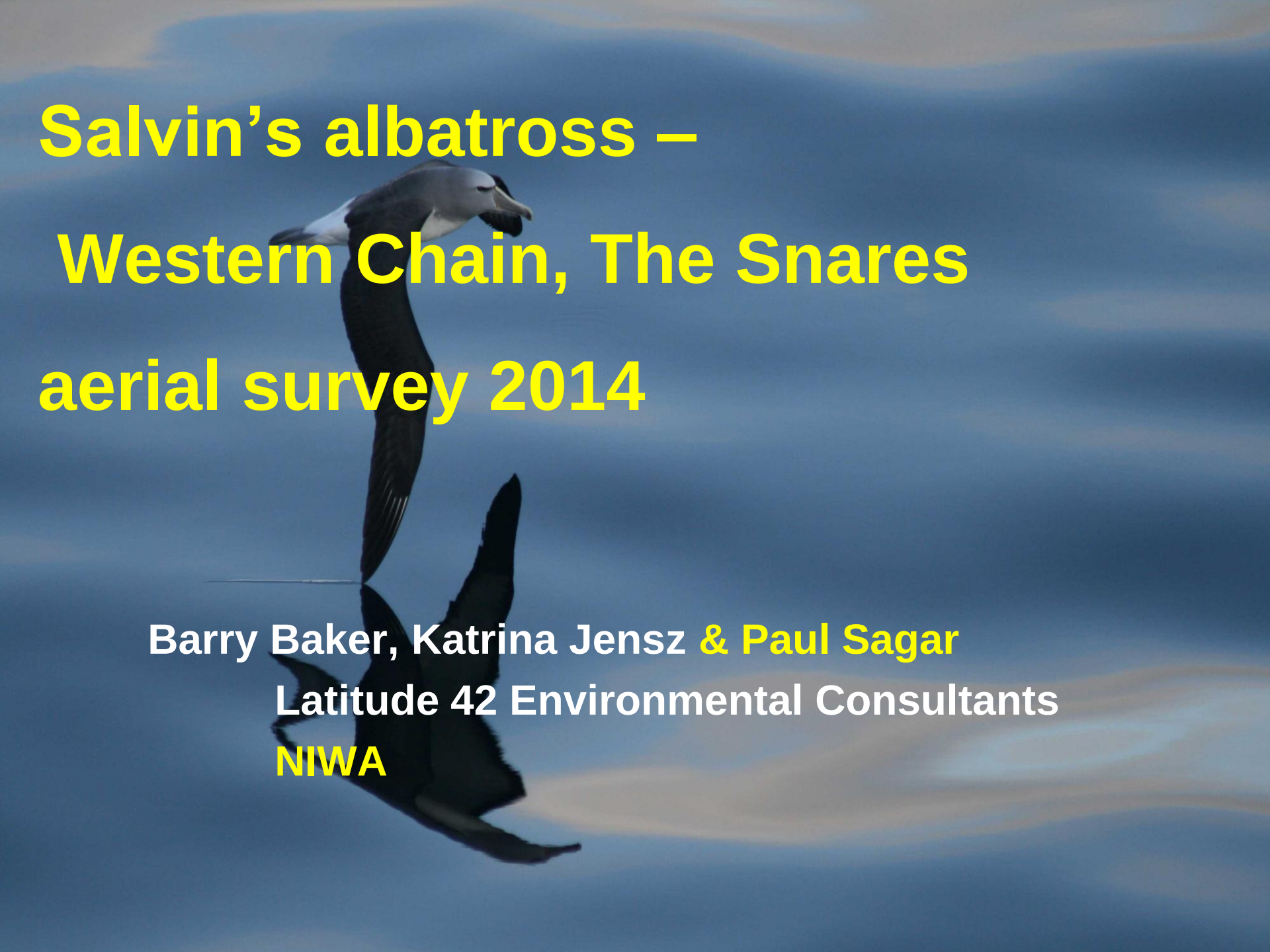
Salvin's albatross – Western Chain, The Snares aerial survey 2014



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Latitude 42 Environmental Consultants
NIWA

background

—endemic NZ species

— Bounty Islands

98% global population (c.40 000 pairs)

breeds on 7 islands

— Snares Western Chain (c. 1,200 pairs)

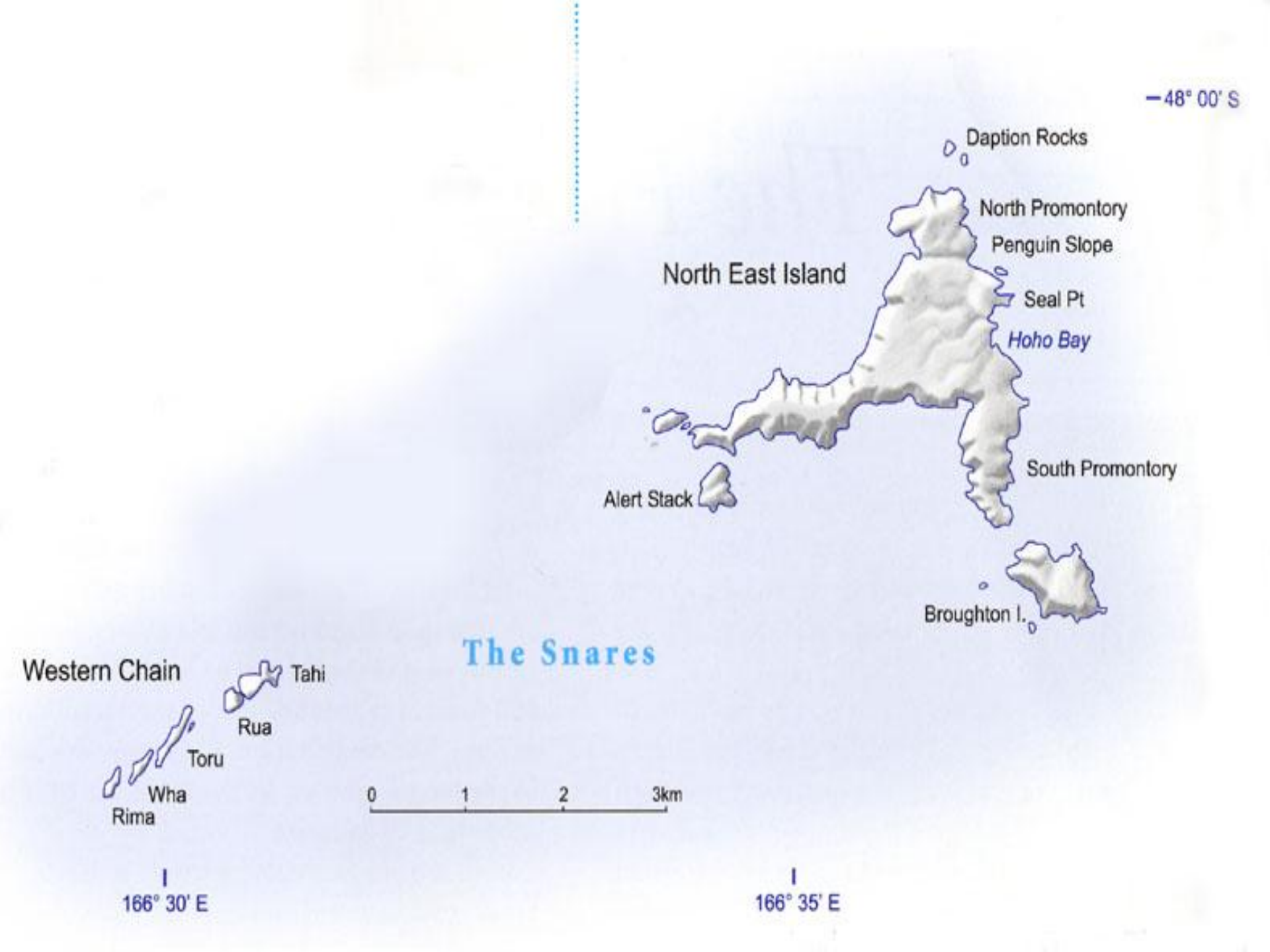
breeds on 2 islets

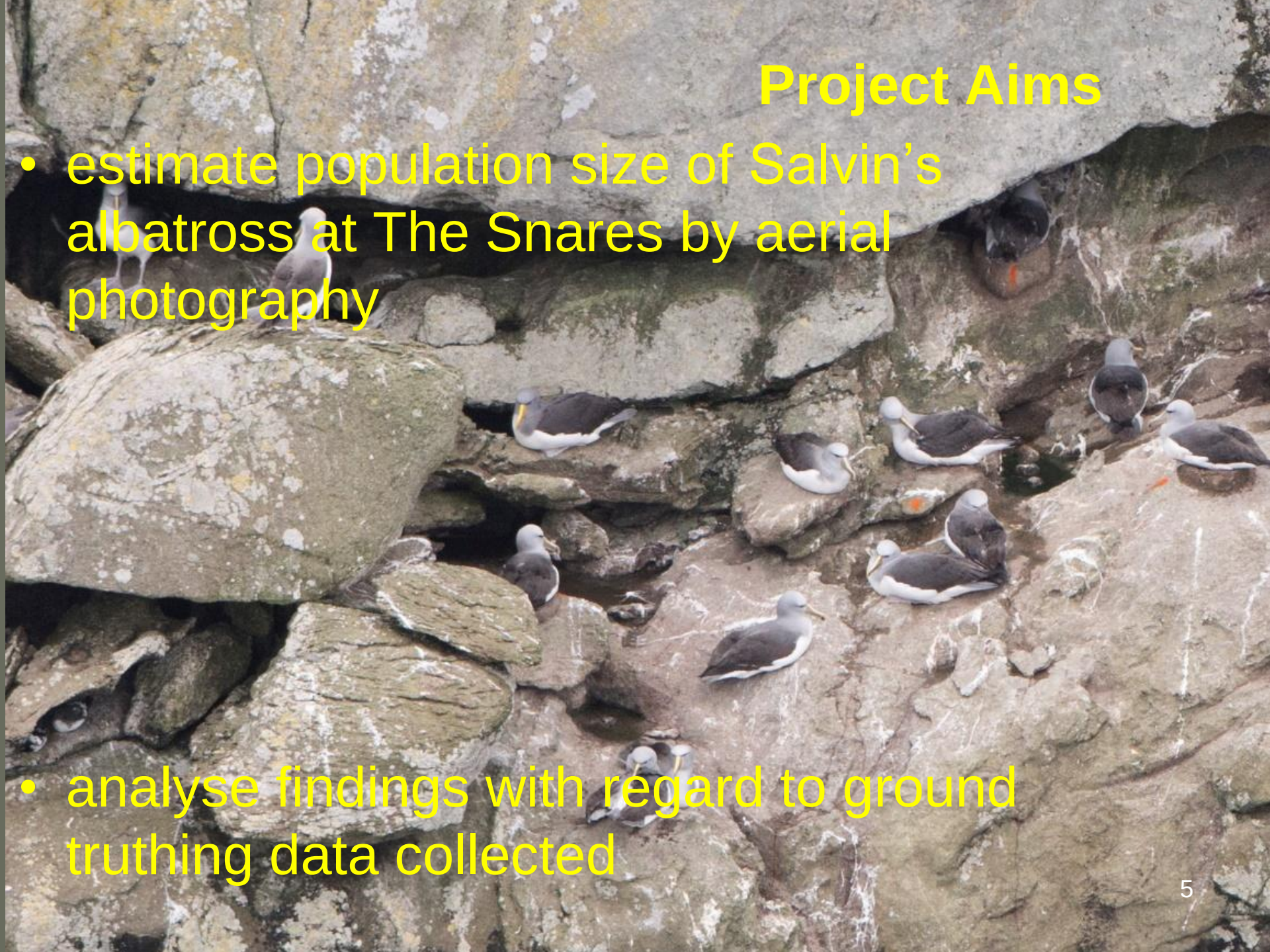
Salvin’s albatrosses one of the least known albatrosses

Poorly studied, breeding restricted to two isolated sites, difficult to access.

Recorded as bycatch in NZ trawl fisheries,

L2RA - Salvin’s albatross 1 of 6 species considered to be at Very High Risk from the impacts of commercial fisheries, following NPOA risk categories


48° 00' S
Daption Rocks
North Promontory
Penguin Slope
North East Island
Seal Pt
Hoho Bay
South Promontory
Alert Stack
Broughton I.
The Snares
Western Chain
Tahi
Rua
Toru
Wha
Rima
0
1
2
3km
166° 30' E
166° 35' E



Project Aims

- estimate population size of Salvin's albatross at The Snares by aerial photography
- analyse findings with regard to ground truthing data collected

methods

- 17 September 2014 flew from Invercargill to the Western Chain
- early-mid incubation
- single-engine Squirrel AS350B3
- population census at Western Chain colonies using aerial photography
- ground truthing Toru Islet.

aerial photography protocol

- Nikon cameras and lenses
- photos taken as fine-scale jpeg or raw files
- overall scenic shots of colonies to assist when building photomontages of the site
- series of overlapping photos of all areas with nesting birds (70 - 200mm)
- close-up photos to examine proportion of empty nests & non-breeding birds (300mm)

ground count protocol

—Toru Islet. 17/09/2014,
same day as aerial photography

—to determine proportions of
- nests containing eggs; &
- non-breeding birds present in the colony

ground count protocol

- transects of variable length X 2m wide
- transect length determined by density of nesting birds, terminated when 100 active nests with eggs located.
- all nests with eggs 1 m either side of lines counted & spot marked; together with empty nests
- all nests with eggs, empty nests with bird on, loafing birds, partners of incubating bird

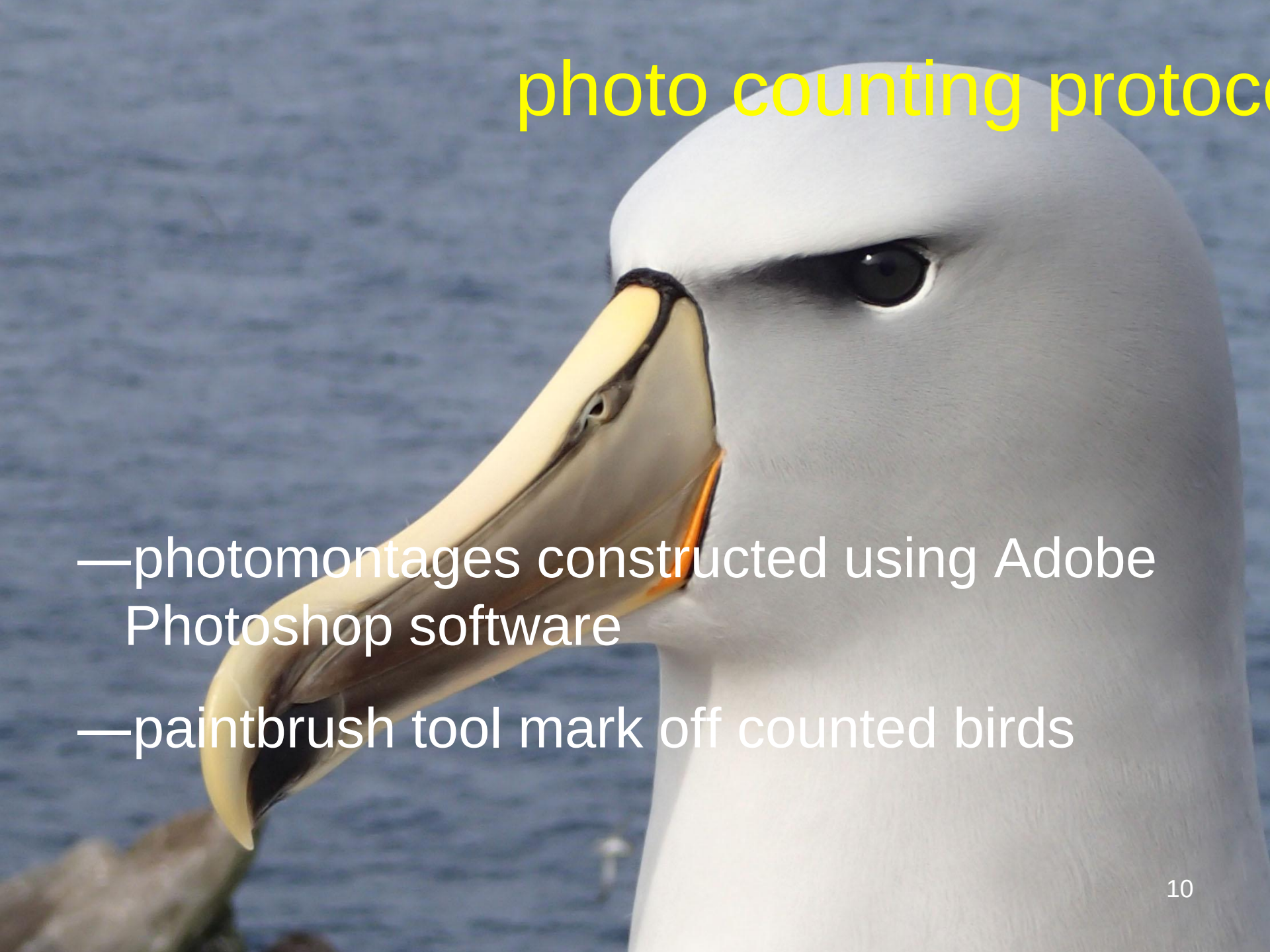


photo counting protoc

—photomontages constructed using Adobe Photoshop software

—paintbrush tool mark off counted birds

data assessment - general

—all birds on the ground counted.

—all images counted by one observer

—based on repeat counts of photos of other albatrosses by 2 other observers, we assumed no observer bias in counting

—counts adjusted to reflect the proportion of non-breeding birds determined by ground-truthing

data assessment – close up photos

Close up photos were analysed and every bird categorised as follows:

- **bird on nest**
- **bird possibly on nest i.e. crouched on rock substrate but no visible nesting material**
- **bird clearly not associated with a nest i.e. standing**
- **breeding status uncertain i.e. bird partially hidden from view**
- **abandoned or broken egg**

ground count results

Counts taken immediately after aerial survey of Toru Islet completed.

Data from Table 4-2 in Sagar et al (2014).

Transect #	Bird on nest with egg	Bird on empty nest	Loafers	Total birds
1	50	5	27	82
2	25	5	20	50
3	25	4	10	39
Total	100	14	57	171
Proportions	0.59	0.08	0.33	

close up photos

- close up photographs were clear and provided sharp images of birds ashore

however

- we were unable to determine if most birds visible were associated with a nest.
- birds could have been sitting on nests or simply resting on rocks
  - 16% birds with a nest
  - 23% loafing
  - 61% breeding status unknown

correction factors

- the proportions of birds assessed as loafing through the use of close up photographs greatly exceeded that derived from ground counts (66% v 33.3%)
- This differs greatly from our experiences with white-capped albatrosses and royal albatrosses where the concordance between ground and aerial close-ups is high
- we conclude that aerial close-ups are not of much use in developing correction factors

aerial counts

Island	Raw Count (incl. partners)	Raw Count (excl. partners)	Correction factor (loafers only)	Adjusted total	
				Aerial count	Ground count
Rima	675	638	0.33	427	301
Tori	1632	1,580	0.33	1,059	824
Total Western Chain	2,307	2,218	0.33	1,486	1,125
SE	48.03	47.10		38.55	

- Difference between aerial & ground estimates – 32% before adjustment to account for broken eggs
- Difference when broken eggs considered – 23%

alternative correction factor

Noting that the results of transect counts showed that 41.5 % of birds ashore were not breeding
(loafers and birds on empty nests)….

A comparison of the ground estimate of breeding birds incl. broken eggs with total birds ashore (aerial counts) leads to an estimate that

1-(1213 / 2307) or
47.4 % of birds ashore were not breeding

Adjusting future aerial counts of total birds ashore by 40-50 % to derive annual estimate of popn size may be appropriate.

conclusion

- aerial survey is effective method of counting the total birds ashore at the Western Chain
- proportion of non-breeding birds (41.5%) is high, but may be normal for this species given nature of breeding sites
- assessing population size of Salvin's albatross from aerial counts requires application of a considerable correction factor (40-50%)
- assessing population size from ground counts also requires application of a large correction factor.
  As reported here and in Sagar et al 2014, no correction was made for the 8% of birds sitting on empty nests.

conclusion

- Confident that:
  - few nests remained undetected in ground counts
  - estimate of total birds ashore (aerial counts) is accurate
- possible the transects used in the ground-truthing exercise were not completely representative of both islets as a whole, & that groups of non-breeding birds were counted in the aerial survey, but ignored in ground count
- Further ground-truthing undertaken concurrently with aerial photography would be of use to refine a correction factor for this site and species
- aerial photography could be used to count number of birds ashore as an index of abundance to assess population trend over time.

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