

White-capped albatross aerial photographic survey 2016



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G. Barry Baker & Katrina Jenz
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1. Introduction

White-capped albatrosses *Thalassarche steadi* are endemic to New Zealand, breeding on Disappointment Island (72 000 pairs), Adams Island (100 pairs) and Auckland Island (3 000 pairs) in the Auckland Island group, and Bollons Island (50-100 pairs) in the Antipodes Island Group (Gales, 1998). The population estimates of Gales (1998) and our previous work have shown that most (95%) of the global population breeds on Disappointment Island, an area where access is restricted to maintain environmental values at the site.

Ground and aerial photographs were undertaken of Disappointment Island colony in 1972, 1981, 1985, 1990 and 1993 by others (Taylor, 2000) but no reports or papers have been produced from these surveys. Despite this early work the population status of white-capped albatrosses was poorly known until 2006 when we commenced annual population censuses of white-capped albatrosses breeding on the Auckland Islands using aerial photography. These population censuses have now been conducted over nine years permitting population size to be estimated and population trends determined. (Baker et al. 2015).

We have now been contracted by the Department of Conservation to conduct another aerial survey of the Auckland Islands to build on the recent population census work. Specifically, the objectives of the project were to:

1. Conduct an aerial photographic census of white-capped albatross at the Auckland Islands following the methods of Baker et al (2015), suitable to estimate the total number of breeding pairs.
2. Provide aerial (helicopter) support for other researchers under contract to DOC to access Dundas Island from Enderby Island, and potentially other islands in the Auckland Islands group, as requested by the lead investigator(s) of that/those project(s).
3. Ensure survey flights are timed to maximise comparability to the results of Baker et al (2015), to the extent possible given weather and other logistical limitations.
4. Archive all photographic data obtained for white-capped albatross in accordance with the protocols described by Baker et al (2015).

In this report we describe the methods and results used in the aerial survey undertaken in the 2015/16 breeding season in the Auckland Islands.

2. Methods

The Site

The Auckland Islands (50° 44'S, 166° 06'E) lie 460 km south of New Zealand's South Island, and comprise the largest island group in the New Zealand sub Antarctic. The archipelago consists of four larger islands (Auckland, Enderby, Adams and Disappointment Islands, together with a set of smaller islands (Peat 2006). Within the archipelago, white-capped albatross breed mainly on Disappointment Island, located to the west of the main Auckland Island, with smaller colonies situated on the South West Cape of Auckland Island and on the southwest coast of Adams Island (Tickell 2000). Disappointment Is. is 4 km long by up to 1 km wide, and is covered in *Poa* grassland and giant herbs, with scattered areas of shrubland and fellfield around the top of the island (Peat 2006). The island rises steeply from the sea to a plateau, with white-capped albatrosses breeding extensively on the slopes but avoiding the plateau. Birds breeding at the colonies on South West Cape and Adams Island also confine nesting to steep, tussock-covered slopes.

Field Work – White-capped albatross

Field work for previous years (2006-2014) has been previously described in Baker et al 2015). Every year from 2006/07 (hereinafter 2006) to 2014/15 (2014) we chartered a helicopter from Southern

Lakes Helicopters Company to conduct a return flight to the Auckland Islands group. The aircraft, a single-engined Squirrel AS350B3, was piloted by either Chris Green, Sir Richard Hayes or Mark Deaker (Southern Lakes Helicopters Company). On board in January 2016 was Barry Baker (photographer and project coordinator), and two Department of Conservation representatives.

From 2006 to 2010 flights were conducted in December to coincide with the early incubation period of the breeding cycle. At this time it was anticipated that birds would have just completed egg laying (M. Double unpublished; P. Sagar unpublished), and hence most birds that attempted to breed would still be attending active nests. The dates of our previous visits to the Auckland Islands were 16 December 2006, 13 December 2007, 14 December 2008, 3 December 2009 and 15 December 2010. For logistical reasons the counts since 2011 were undertaken in January (11 January 2012, 14 January 2013 and 20 January 2014). The 2015 counts were undertaken on 13 January 2016 when all colonies (Disappointment Island, SW Cape, Adams Island) were photographed. The timing of January counts is not ideal with respect to the breeding cycle of white-capped albatross, as although hatching would not have commenced, some nests could be expected to have failed and those breeding birds may have abandoned their breeding sites.

For all flights we selected a weather window for the operation that predicted clear flying conditions with minimal low-level cloud. At the time of the 13 January 2016 flight the weather around the Auckland Islands was calm and fine. We were able to obtain clear photographs of all Auckland Islands colonies. Weather conditions during all flights are shown below:

Date	Weather conditions encountered during photographic survey
16/12/2006	calm and fine, no cloud
13/12/2007	calm and fine, minimal cloud
14/12/2008	calm and overcast, cloud base over 1,200 metres. On a couple of occasions light showers encountered
3/12/2009	calm but overcast, cloud base 600 metres. Light showers and sea fog encountered during flight over Disappointment Island, obstructing visibility of the top of the island on occasions.
15/12/2010	calm and fine, minimal cloud
11/01/2012	calm and fine, minimal cloud
14/01/2013	calm and fine, minimal cloud
20/01/2014	wind gusting to 40 knots, overcast, cloud base 1500 metres
14/01/2015	calm and fine, minimal cloud
13/01/2016	calm and fine, minimal cloud

Photography was timed to occur between 1100 to 1600 NZDT. Although there is little information on the behaviour of breeding white-capped albatrosses, information from the closely-related shy albatross *Thalassarche cauta* indicates that during the early incubation period the ratio of incubating to loafing birds is high as most loafers are at sea during the middle of the day (B. Baker unpublished). This assumption has subsequently been confirmed by observations at the South West Cape colony in December 2007 (Paul Sagar and David Thompson, unpublished) and in ground counts undertaken in 2014 and this year at Disappointment Island (Graham Parker, Kalinka Hexer-Ruber and Paul Sagar, unpublished), although the number of loafers was higher during January counts, based on photographic evidence and ground counts (see below).

In January 2016 photography for each site was conducted as follows:

- Disappointment Island c.1310 to 1430 NZDT;
- South-West Cape 1440 to 1455 NZDT; and
- Adams Island (Logan Point) 1500 to 1505 NZDT

At each colony we conducted two circuits to provide images suitable for counting the breeding birds on the island, which were taken using a photo-extension of 70 mm. Additional photographs using maximum photo-extension (200 mm or 300mm) were also taken at Disappointment Island, the largest of the colonies, to assist in determining the proportion of empty nests and non-breeding birds in the colonies.

For the photography in January 2016, the photographer was positioned on the rear seat of the port side of the aircraft, with the rear door open. All photographs were taken using Nikon D800 digital cameras and image-stabilised Nikkor 70— 200 mm F2.8 and a 300 mm F2.8 telephoto lens. Shutter speeds were set at 1/1000 s or faster to minimise camera shake, and every effort made to ensure that the photographs were taken perpendicular to the land surface. The focal length of the zoom lens was not adjusted within each pass sequence over the island. The photos taken are a complete series of overlapping images that cover the entire area of the sites where albatrosses were nesting; approximately 2,200 digital photographs were taken during the survey flight. All photographs were taken as NEF raw files. The survey photographs of Disappointment Island were taken at an altitude of about 400 metres, well above the minimum limit of 300 m recommended by DOC. Most photographs were taken with the zoom lens set at a focal length of 70 mm. The close-ups were taken using the 300 mm telephoto lens. The entire set of photographs were subsequently replicated to ensure that four complete back-up sets existed both on portable hard drives and in at least three different locations. A full set of photographs was provided to the Department of Conservation, Invercargill Office (Ms Sharon Trainor) on return from the Auckland Islands for on passing to DOC Wellington.

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