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# Antipodean wandering albatrosses (*Diomedea antipodensis*) colonising the Chatham Islands

COLIN M. MISKELLY
Wellington Conservancy, Department of Conservation, P.O. Box 5086, Wellington 6011, New Zealand
*cmiskelly@doc.govt.nz*

NATHAN McNALLY*
Pitt Island Field Centre, Chatham Islands Area Office, Department of Conservation, P.O. Box 114, Waitangi, Chatham Islands 8942, New Zealand

RON SEYMOUR
South Coast, P.O. Box 90, Waitangi, Chatham Islands 8942, New Zealand

DIANNE GREGORY-HUNT
Pitt Island, Chatham Islands 8942, New Zealand

JADE LANAUZE
Pitt Island, Chatham Islands 8942, New Zealand

**Abstract** Large albatrosses, subsequently identified as Antipodean wandering albatrosses (*Diomedea antipodensis*), began prospecting for nest sites inland from the south-western coast of Chatham Island about 1998. The 1st egg was laid about the end of Mar 2003. What is presumed to be the same female laid an egg nearby in Feb 2004 and 2005. Although the 2004 egg hatched, each of these 3 breeding attempts failed. A subadult male Antipodean wandering albatross was found in Waipaua Scenic Reserve on Pitt Island in May 2002, and what may have been the same bird was ashore at the same site in Jan 2004. An egg was found at this site in Apr 2004 and the resulting chick fledged in Jan 2005. What is presumed to have been a different pair was found with an egg on Mount Hakepa, Pitt I, in early Jan 2006; their egg hatched in Apr 2006, and the chick fledged about 7 Jan 2007. What is presumed to be the same pair also nested successfully at the Mount Hakepa site in 2008/2009, with the chick fledging on 6 Jan 2009. These 6 breeding attempts (3 successful) by perhaps 3 different pairs at widely spaced sites on the Chatham Islands are the 1st records of Antipodean wandering albatrosses breeding away from the Antipodes Is and Campbell I.

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**Keywords** Antipodean wandering albatross; *Diomedea antipodensis*; *Diomedea exulans*; Chatham Is; colonisation; breeding

## INTRODUCTION

The Chatham Is are the main (for one, the only), breeding site for 3 species of albatross. The breeding sites are all remote rocky islets: northern royal albatrosses (*Diomedea sanfordi*) and Pacific mollymawks (*Thalassarche bulleri* subsp.) breed on The Sisters and The Forty Fours, and Chatham Is mollymawks (*T. eremita*) breed on The Pyramid (Aikman & Miskelly 2004). There are no historical accounts of albatrosses breeding on the 2 largest, inhabited islands (Chatham I, 90,000 ha; Pitt I, 6300 ha), but extensive bone deposits reveal that Motutapu Point and Tarawhenua Point, northern Pitt I, were formerly breeding sites for a large albatross, most likely the northern royal albatross (Holdaway *et al.* 2001). There is no evidence that any great albatross other than *D. sanfordi* has ever nested on the Chatham Is (Holdaway *et al.* 2001, *contra* Robertson *et al.* 1997).

Large albatrosses have been seen on and over Chatham and Pitt Is since at least 1998. It was assumed that these birds were northern royal albatrosses until a video recording of an adult female Antipodean wandering albatross (*D. antipodensis*) on a nest was obtained in Apr 2003. Earlier photographs and video (May 2001; Feb 2003) and all subsequent verified sightings of albatrosses on and over Chatham and Pitt Is have also proven to be of Antipodean wandering albatrosses. We here

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*Current address: Coastal Otago Area, Department of Conservation, P.O. Box 5244, Moray Place, Dunedin 9058, New Zealand

report on the 1st breeding attempts by Antipodean wandering albatrosses on the Chatham Is: 3 on Chatham I (presumed same pair, in 2003, 2004, 2005) and 3 on Pitt I (two presumed different pairs at separate sites in 2004/05, 2006/07 and 2008/09). Preliminary information on these colonisation attempts was provided by Aikman & Miskelly (2004), and Miskelly *et al.* (2006).

The Antipodean wandering albatross is a dark-plumaged wandering albatross. Its major breeding grounds are on Antipodes I (average 5136 pairs annually; Walker & Elliott 2005), with *c.*10 pairs per annum breeding on Campbell I (Peter Moore, *pers. comm.*). The closely related Gibson's wandering albatross (*D. gibsoni*) breeds on the Auckland Is. Recent genetic comparisons indicate that it should be considered conspecific with *D. antipodensis,* and that together they are specifically distinct from the south Atlantic and south Indian Ocean wandering albatrosses *D. exulans* (Burg & Croxall 2004; cf. Robertson & Warham 1992; Robertson & Nunn 1998). Here, we accept *D. antipodensis* as a full species.

## SIGHTINGS and BREEDING RECORDS

### Pre-breeding records from Chatham I

Local landowners and their guests have reported to the Department of Conservation sightings of large albatrosses (mainly in flight) from farmland south of the Tuku-a-tamatea River since *c.*1998. Localities where they were seen in flight included Taiko Camp and Sweetwater Covenant (land owned by Bruce & Liz Tuanui), southern Murphys Hill, Otauwe (= Otawae) and the Kawhaki and Waipurua catchments (land owned by RS), and near The Horns (land owned by the Holmes family) (Fig. 1). Between 1999 and Feb 2003, birds now assumed or known to be adult male Antipodean wandering albatrosses were seen on the ground by local landowners on at least 5 occasions: inland from Otauwe Point in Apr 1999 (RS, *pers. obs.*) and May 2001 (Jan Holmes, *pers. comm.*); on the northeastern flanks of The Horns in 1999 (Robert Holmes, *pers. comm.*); between Murphys Hill and Kawhaki Creek on 22 Mar 2000 (RS, *pers. obs.*); and on the ridge between Kawhaki and Waipurua creeks on 19 Feb 2003 (Phil Seymour, *pers. comm.*).

Until 2003, these birds were assumed to be northern royal albatrosses. Following the discovery of a female Antipodean wandering albatross on a nest in Apr 2003 (see below), CMM was shown photographs and video footage in Apr 2003 of adult male Antipodean wandering albatrosses obtained on 2 of these occasions: photographs obtained by Jan Holmes at Otauwe in May 2001, and possibly the same bird videoed by Phil Seymour (PS) on the ridge between Kawhaki and Waipurua creeks on 19 Feb 2003. An albatross was on the ground at Thomas Mohi Tuuta (Rangaika) Scenic Reserve, south-east Chatham I, in Nov 2003 (Alfred Preece, *pers. comm.*).

### Breeding attempts on Chatham I

*2003* An adult female Antipodean wandering albatross was videoed by PS on 3 Apr 2003 sitting tight on a nest on the ridge between Kawhaki and Waipurua creeks. This was *c.*300 m from where an adult male Antipodean wandering albatross had been videoed by PS on 19 Feb 2003. The female was still on the nest when Robert Holmes (RH), PS, and CMM visited late in the afternoon on 9 Apr 2003, and she was found to be sitting on a fresh egg (Fig. 2). RH & PS believed that the bird or its mate were not present on their last visit on *c.* 28 Mar. This suggests that the egg was laid about the end of Mar. The bird was also on the nest on 10 Apr (PS, *pers. comm.*).

CMM saw 4 other Antipodean wandering albatrosses in flight near the nest by on 9 Apr. An adult male flew from over The Horns out to sea, then inland over Otauwe, then over the nest site, then out to sea again; the female briefly spread her wings when he was overhead. About 45 min later, 3 albatrosses (a female pursued by 2 males) were watched in synchronised flight from over The Horns to far inland (then visible only by 8× binoculars). Although these birds were never closer than 1 km from CMM, both males appeared darker than the lone male that flew over the nest site.

The nest site was on a flat-topped ridge or plateau *c.*150 m a.s.l. and *c.*800 m inland from the coast. The nest was in an extensive area of rough pasture and low fern (*Pteridium esculentum* and *Blechnum procerum*). In contrast, most surrounding farmland was "cleaner", with little fern. The nest was close to where 2 farm tracks merged, and the birds may have used the low sward on the tracks as take-off runways.

Robert & Jan Holmes found the egg damaged, probably by weka (*Gallirallus australis*), *c.*5 m from the nest on 25 Apr 2003, and no birds were present. As no male had been seen at the nest, it is possible that the female had abandoned the egg, which was then consumed by a weka. The damaged egg is now in Te Papa/Museum of New Zealand (OR.027237, width 76.0 mm, length not measurable; Gillian Stone, *pers. comm.*). CMM revisited the site on 22 May 2003, and found the nest destroyed, and *c.*12 fairly fresh albatross feathers present. There was a fresh pig dropping near the nest, but no other feathers or bird remains were found during a search of the area within *c.*50 m of the nest. Conditions were misty, and no albatrosses were seen in flight or on the ground.

*2004* In 2004 what may have been the same pair nested 270 m down the ridge closer to the sea, at *c.*130 m a.s.l. The site was in rank pasture with some bracken fern (*Pteridium esculentum*). An albatross was 1st noticed at the site (no egg) on 31 Jan 2004, but a bird was sitting tight, probably on an egg, on 2 Feb (RS, *pers. obs.*). A male was on a fresh egg on 7 Feb (Fig. 3), and a female

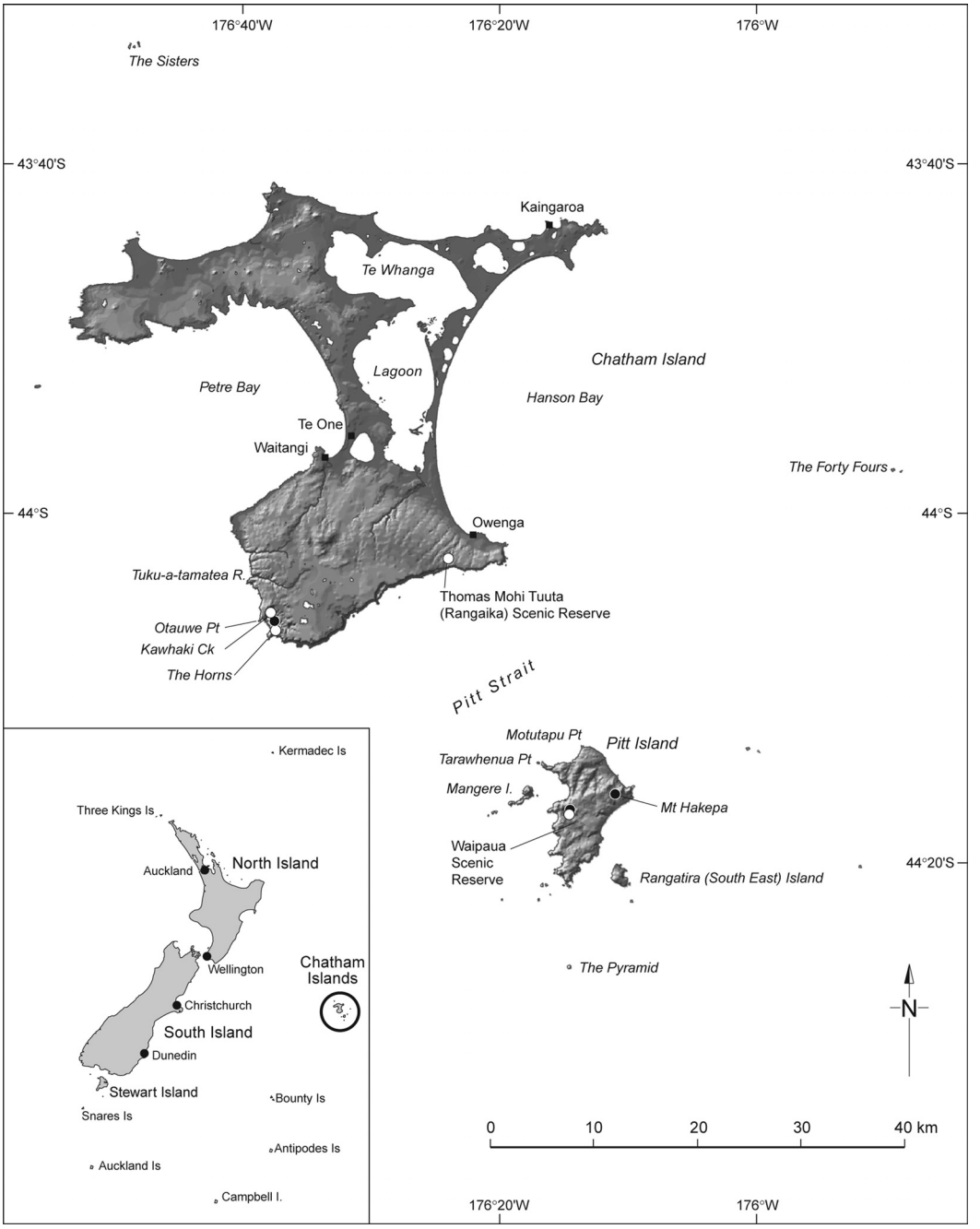


**Fig 1** Locations where albatrosses (all assumed to have been Antipodean wandering albatrosses, *Diomedea antipodensis*) have been seen ashore on Chatham and Pitt Is, 1998-2006. White circles, sightings of single birds not associated with nests; black circles, nests. Note that 3 breeding attempts (probably all the same female or pair) occurred close together in southwest Chatham Is in 2003-2005. Albatrosses were seen ashore at all 3 breeding sites 1.5 months - 2 years before eggs were found.

was incubating on 13 Feb (RS, *pers. obs*.). The male was banded by Graeme Taylor on 7 Feb 2004. RS checked the nest regularly over the next 2 months while repairing the surrounding stock fence, recording which adult was present on each occasion: 16 Feb, female; 22 Feb, male; 3 Mar, female with male flying near; 6 Mar, female; 13, 17 Mar both birds present (female incubating on 13 Mar, but later that day the female had gone and the

**Fig. 2** Adult female Antipodean wandering albatross (*Diomedea antipodensis*) incubating an egg, Kawhaki/Waipurua ridge, Chatham I, 9 Apr 2003. Photo: C. Miskelly.

**Fig. 3** Adult male Antipodean wandering albatross (*Diomedea antipodensis*) incubating an egg, Kawhaki/Waipurua ridge, Chatham I, 7 Feb 2004. Photo: G. Taylor.

male was incubating); 20, 22, 29, 31 Mar, 1 Apr, female; 4, 5, 8, 9 Apr, male (female flew near for 15 min on 8 Apr); 10, 12, 13 Apr, female; 14, 15, 16 Apr, male. The male was sitting on a small dead chick (estimated to be <1 week old) on 15 Apr 2004 (Adam Bester, *pers. comm.*). The male remained for another day, but had gone on 17 Apr (RS, *pers. obs.*).

*2005* A female Antipodean wandering albatross was seen in flight near the 2004 nest on 26 Jan 2005 (Cameron Tiller, *pers. comm.*). On 31 Jan, flattened grass, fresh droppings, and an albatross feather were found nearby. A female was found on the ground at a 3rd nearby site (50 m from 2004 nest) on 2 Feb 2005, where a female was seen also on 3 Feb (RS, *pers. obs.*). On 4 Feb the female had moved *c.* 10 m and was sitting on a fresh egg; she had made no attempt to construct a nest. The male was never seen, and the abandoned but intact (132.3 × 77.0 mm; Paul Gasson, *pers. comm.*) egg was found by RS on 10 Feb.

*2007* An Antipodean wandering albatross was seen flying near the 2003-2005 nest sites on 8 Nov 2007 (Ken Hunt, *pers. comm.*).

**Pre-breeding records on Pitt I**

On 5 May 2002, Gary & Joshua Seymour found a sub-adult Antipodean wandering albatross ashore in the northwestern corner of Waipaua Scenic Reserve, western central Pitt I. It was photographed by Joshua's teacher, Rob Cameron, and the image was forwarded to CMM for identification. As no other reports of Antipodean wandering albatrosses ashore on the Chatham Is were known at the time (the bird photographed at Otauwe in May 2001 was not reported to CMM until Apr 2003), it was assumed that this bird was a storm-driven straggler. Following the 1st successful breeding at this site in Waipaua Scenic Reserve (see below), Kenneth Lanauze (*pers. comm.*) reported a male Antipodean wandering albatross on Mount Hakepa in early Jan 2005, near where JL found a pair with an egg in Jan 2006.

**Breeding attempts on Pitt I**

*2004/2005* DOC staff member Robin Seymour photographed a male Antipodean wandering albatross beside an empty nest in the northwest corner of Waipaua Scenic Reserve about 15 Jan 2004. In mid Apr 2004, Cole, Levi, and Zin Lanauze (secondary school students out pig-hunting) found an adult incubating an egg at this site. The nest site was in a small gully of rank pasture *c.*120 m a.s.l. and *c.*1 km inland from the coast, and near where an albatross had been caught in May 2002. The egg was partly-hatched on 17 Apr 2004 (Marie Gregory-Hunt, *pers. comm.*). Based on an incubation period of 79 days (Kath Walker, *pers. comm.*), this egg would have been laid about 28 Jan 2004. Considerable efforts were made to safeguard the chick from predators (see below). During regular checks of the nest between 13 Jun and 6 Sep, the male parent was seen with the chick on 4 occasions between 15 Jun and 23 Aug, and the female twice (4 Jul; 6 Sep). The chick (Fig. 4) was banded on 29 Oct 2004. It developed an infection in its left eye in mid-Jan 2005, and was treated with topical antibiotic twice a day until it fledged either late on 28 Jan 2005 or early the next day. An adult albatross was seen *c.*400 m from this site in early 2006 (Kenneth Lanauze, *pers. comm.*).

*2006/2007* A pair of Antipodean wandering albatrosses with an egg was found by JL in Jan 2006 on Mount Hakepa, *c.*5 km from the Waipaua Scenic Reserve breeding site (Fig. 1). The nest was in an extensive area of low fern (*Pteridium esculentum*; *Blechnum procerum*) on the shoulder of Mt Hakepa, *c.*220 m a.s.l. and *c.*1 km inland from the coast. The egg hatched about 15 Apr (JL & NMcN, *pers. obs.*), and the chick was healthy on 9 Aug 2006 (Dave Houston, *pers. comm.*; Fig. 5) and fledged about 7 Jan 2007 (Kenny Dix, *pers. comm.*).

*2008/2009* A newly-hatched albatross chick guarded by an adult was found about 50 m from the 2006/2007 nest site on Mount Hakepa on 30 Apr 2008 (Kenny Dix, *pers. comm*.). The chick fledged on 6 Jan 2009. Single adult albatrosses continued to be seen occasionally at the Waipaua Scenic Reserve site between Jan 2007 and Feb 2009 (DG-H, *pers. obs*.).

**Protection of nest sites**

There are several potential albatross nest predators on Chatham I and Pitt I. Perhaps the most serious are feral pigs (Flux 2002; Shirihai 2002: 97) and feral cats (*Felis catus*), but there are also weka, and pig-hunting dogs (*Canis familiaris*) on both islands, and brush-tailed possums (*Trichosurus vulpecula*) on Chatham I. Feral and farm stock (cattle *Bos taurus*; sheep *Ovis aries*) could also disturb nesting albatrosses, as cattle have been implicated in the decline of the Amsterdam wandering albatross (*D. amsterdamensis*) by destruction of their nesting habitat (Jouventin *et al.* 1989). Rats (present only on Chatham I) pose a smaller threat to successful breeding. Both Antipodean wandering albatrosses and southern royal albatrosses *D. epomophora* bred in the presence of large numbers of Norway rats *(Rattus norvegicus)* on Campbell I, though downy chicks were occasionally attacked and killed by rats (Peter Dilks, *pers. comm*.). On Gough I, the house mouse (*Mus musculus*) has significantly increased in size, and by attacking downy chicks in the way rats on Campbell I did, appears to be causing very low breeding success for the Tristan wandering albatross (*D. dabbenena*) (Cuthbert & Hilton 2004).

Two of the nests on Chatham I failed before any nest protection measures could be undertaken, but there was no conclusive evidence that predators caused these nests to fail. Electric fences were erected or restored around the 2 nests (1 on each island) in 2004 to reduce the risk of pigs and other feral or farm stock reaching the nests. The Chatham I fence had not been completely restored when the nest was found to have failed, but again the failure was not caused by a predator. Care was taken to ensure that the fences did not cross the apparent or most likely take-off routes used by the albatrosses, and at least 2 ha was fenced at each site. The Mt Hakepa site (2006) was judged to be at little risk from feral pigs or farm stock. The Pitt I community took great interest in the welfare of the 2004 chick; 60 feral pigs *(Sus scrofa)* were killed nearby in late May 2004, and DG-H helped NMcN checking 8 traps set for feral cats around or in the fenced area, which caught 9 cats between 13 Jun and 6 Sep.

Cats were not considered to be a major risk for the 2004 nest on Chatham I, or the 2006 and 2008 nests on Pitt I, as there were few other food resources nearby to attract cats to these sites. Cats were more likely to occur along the coast, along watercourses, and in forest > 1km from the nests.

**Fig. 4** Antipodean wandering albatross (*Diomedea antipodensis*) chick, Waipaua Scenic Reserve, Pitt I, 10 Jan 2005. Photo: N. McNally.

**Fig. 5** Antipodean wandering albatross (*Diomedea antipodensis*) chick, Mt Hakepa, Pitt I, 9 Aug 2006. Photo: D. Houston.

## DISCUSSION

The 6 breeding attempts by (presumed) 3 different pairs of Antipodean wandering albatrosses at 3 widely scattered sites over a 6-year period, when there had been no previous records, indicate a concerted effort by several individuals to colonise a new breeding location. Only 10 of the presumed 12 adults associated with the 6 nests were seen (i.e. no male was seen at the 2003 and 2005 nests on Chatham

I), and only 1 of the adults was banded (the male at the 2004 nest on Chatham I). This cautious approach (to minimise disturbance to breeding adults) meant that we were unable to determine whether the 3 breeding attempts on Chatham I (in consecutive years, all within 300 m of each other), and the first 2 breeding attempts on Pitt I (2 years and 5 km apart) were made by any more or any less than 3 different pairs. Five adult albatrosses were seen on or over Chatham I on 9 Apr 2003, but these may have included birds that subsequently laid on Pitt I.

It is also possible that other, undetected, breeding attempts were made on both islands. Although Antipodean wandering albatrosses are huge, their predominantly brown or vermiculated plumage and preference for areas of rank pasture and fern make them difficult to detect from a distance. All the sightings of birds on the ground reported here were chance encounters initially, and observers visited only a small proportion of the extensive pastoral landscapes available to the birds. We note that 2 potential breeding pairs were not located in 2006, namely the successful 2004/2005 pair on Pitt I, and the pair that failed for 3 consecutive years (2003-2005) on Chatham I.

We do not know why these albatrosses were attracted to inhabited islands, populated by potential predators, and >600 km north of their nearest breeding site. Colonisation began while the Antipodean wandering albatross population on Antipodes I was recovering from a large decline in the 1970s-1980s, and was growing at an estimated 3.1% annum$^{-1}$ (Elliott & Walker 2005). Nesting space does not appear to be limiting expansion of the breeding population on Antipodes I (Kath Walker, *pers comm.*). However, satellite tracking of Antipodean wandering albatrosses tagged at their major breeding ground on Antipodes I revealed that many birds foraged northeast of the Antipodes group, over the shelf slope off the Chatham Rise (Walker & Elliott 2006), so nesting closer to this feeding area would save breeding and courting birds some energy in commuting.

A small population of Antipodean wandering albatross has existed for many years on Campbell I, 870 km south-west of Antipodes I. However, this population has never expanded beyond a few dozen birds, possibly because the island already has a much larger royal albatross population. A banded Antipodean wandering albatross which finally nested on Campbell I in 2004 (Peter Dilks, *pers. comm.*) was seen as a non-breeder amongst *D. exulans* on Macquarie I for several seasons before that (Kath Walker, *pers comm.*).

The birds on the Chatham Is nested at exposed sites on flat or undulating terrain covered in rank grass and low fern 120-220 m a.s.l. and 500-1000 m inland from the sea. This breeding habitat is similar in topography and vegetation structure to the plateau on Antipodes I where most of the taxon breeds (Walker & Elliott 2005; CMM, *pers. obs.*).

Apart from the unexpected breeding location, there was another anomaly in the 1st Antipodean wandering albatross nest found on Chatham I, in that the egg was laid about 6 weeks later than the latest known date for birds breeding on Antipodes I. This may have been because the presumed pair were inexperienced, 1st-time breeders, but no male was confirmed at the nest in 2003 or 2005, apart from 1 that flew over the nest on 9 Apr 2003.

Great albatrosses usually nest only every 2nd year if they breed successfully, as it takes about 12 months for them to incubate the single egg and raise a chick. Breeders that fail early may return to breed the following year. Antipodean wandering albatrosses on Antipodes I lay their eggs from 7 Jan to 17 Feb, with the mean lay date 23-26 Jan (Walker & Elliott 2005). Incubation is shared by the sexes and takes *c.*79 days. The female typically departs to sea 2-3 days after laying, and the male normally takes the 1st long incubation stint. The pair then exchange incubation duties every 6-14 days until hatching (Apr-May). The chick is brooded continuously by either adult for its 1st month, by which time it can maintain its own body temperature, and can fend off most natural predators, such as skuas *Catharacta skua lonnbergi* and northern giant petrels *Macronectes halli*. The chick takes *c.*275 days (9 months) to fledge (Tickell 1968), and most Antipodean wandering albatrosses fledge in Jan (Walker & Elliott 2005).

The laying dates for the 5 subsequent nests found on the Chatham Is (2004-2008) all matched those recorded on Antipodes I, with eggs probably laid between early Jan and early Feb, and the 3 chicks all fledging in Jan.

All 3 known breeding attempts on Chatham I failed, and all 3 failures were likely to have been as a result of the pair's inexperience. In 2003 and 2005 it appears that the male failed to relieve the female after laying, and she deserted the nest. In 2004 it is thought that an adult trampled the chick soon after hatching. If all 3 breeding attempts on Chatham I were by the same pair, the distance between the 2003 and 2004 nests (270 m) was exceptional. The greatest distance between successive nests recorded on Antipodes I was 77 m (Walker & Elliott 2005).

The diversity of albatross species breeding on the Chatham Is has, with these observations, increased from the traditionally recognised 3 (northern royal albatross; Pacific mollymawk; Chatham Is mollymawk) to 7 since 1991. In addition to the Antipodean wandering albatrosses reported here, a single pair of white-capped mollymawks (*Thalassarche cauta steadi*) bred on The Forty Fours in at least 1991/1992, 1996/1997, and 2004/2005 (Robertson *et al.* 1997; P. Scofield *in* Miskelly *et al.* 2006), a single pair of Indian yellow-nosed mollymawks (*T. chlororhynchos carteri*) bred on The Pyramid from 1998 to at least 2003 (C. Robertson

& P. Scofield *in* Miskelly *et al.* 2006*),* and Salvin's mollymawks *(T. salvini*) are believed to have bred on both The Forty Fours (unaccompanied chick, Jan 2005, P. Scofield *in* Miskelly *et al.* 2006*)* and on The Pyramid (1 bred with a Chatham Island mollymawk in 2003; P. Scofield, *in* Miskelly *et al.* 2006*)*. These 4 recently colonised taxa persist in extremely low numbers on the Chatham Is (1-2 breeding pairs annum$^{-1}$). The richness of the seas around the Chatham I will probably continue to attract seabirds seeking to nest close by, but suitable breeding space on predator-free islands in the group is limited.

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