LONG-DISTANCE DISPERSAL OF A CAPE GANNET *MORUS CAPENSIS* AFTER AN EXTENDED PERIOD OF NEST-SITE FIDELITY

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The Cape Gannet *Morus capensis* is endemic to southern Africa, where the species typically displays high levels of nest-site fidelity to its breeding colonies (Crawford 2005). At Mkambati Nature Reserve, in June 2014, we recorded a dead Cape Gannet that had been ringed as a juvenile at Lambert's Bay, ~1 500 km away, in 1991. Following initial banding, it had been recaptured multiple times at the ringing location until 2000. Our observation therefore may provide evidence for long-distance dispersal that took place after an extended period of high site fidelity. We speculate that this dispersal may have been caused by seal-related disturbance at the Lambert's Bay colony or by prey distribution changes or both.

There are five Cape Gannet colonies on the west coast and one (Bird Island, Algoa Bay) on the east coast of southern Africa, all displaying little overlap in foraging areas (Gremillet *et al.* 2004). Cape Gannets prey on small shoaling pelagic fish such as sardines *Sardinops sagax* and anchovies *Engraulis encrasicolus,* captured by surface plunging (Batchelor & Ross 1984, Crawford *et al.* 1991, Crawford 2005). They nest from September to April, with juveniles generally starting to breed at about four years of age (Makhado *et al.* 2006). Adults live 10–20 years but may survive as long as 40 years (del Hoyo *et al*. 1992).

Juvenile Cape Gannets disperse during the non-breeding season over wide areas, from the waters off the western Sahara to those near Tanzania in the southwest Indian Ocean (Baillon & Dubois 1991, Klages 1994, Crawford 2005). Adult birds have also been reported to move along the African coast during the non-breeding season, dispersing up to 3 300 km from their breeding colonies (Hockey *et al.* 2005, Nelson 2005), while their nest-site fidelity remains high (Klages 1994). Similarly, Australasian Gannets *Morus serrator* have been recorded to cross the Tasman Sea from New Zealand to Australia when not breeding, covering distances of up to 13 000 km (Ismar *et al.* 2011). However, adult Cape Gannets tend to remain within 500 km of their breeding site year round (del Hoyo *et al.* 1992), with some adult males continuing to use their breeding site to roost throughout the non-breeding season (Nelson 2005). Dispersal of adults to other colonies during breeding has rarely been recorded (Distiller *et al.* 2012). Although feeding and dispersal during the non-breeding season are critical in terms of population dynamics, these are still poorly documented (Klages 1994, Barbraud & Weimerskirch 2003, Ropert-Coudert *et al.* 2004). More recent tracking data indicate that far-ranging dispersal in this species is generally observed during the juvenile stage, whereas adult birds often forage on fish scavenged from fishing trawlers in nearby waters (Mullers & Navarro 2010).

We recorded a dead, ringed Cape Gannet ashore at Mkambati Nature Reserve in the Eastern Cape, South Africa (31.31°S, 29.99°E), on 26 June 2014. The bird had evidently died recently, and there was no evidence that it had been preyed upon. Data obtained from the South African Bird Ringing Unit (SAFRING) indicated that the individual was banded as a chick at Bird Island, Lambert's Bay, on 5 March 1991. The bird was subsequently recaptured seven times at the same location in 1993, 1994, 1995 (twice), 1997, 1998 and 2000, but was then not recaptured or seen until we discovered it approximately 1 500 km from Lambert's Bay.

We subsequently undertook a basic assessment of all records for individual birds (n = 583) with more than six recorded recaptures in the SAFRING database to assess the frequency and distance of dispersal events of Cape Gannets. Each bird was classified as having displayed (1) no dispersal; (2) temporary dispersal (i.e. birds were recaptured only once away from their known colonies and were subsequently recaptured again at the same site); (3) sub-adult dispersal (i.e. dispersal before breeding); or (4) adult dispersal (i.e. dispersal as an adult, after multiple recaptures at an original colony). Gannets recaptured once at locations within 150 km from their colonies were classified as having displayed no dispersal, since such distances fall well within the average foraging range observed for this species (del Hoyo *et al.* 1992).

Of the 583 birds with multiple resightings, 569 (98%) were never recorded further than 150 km from their original ringing locations. Five gannets (< 0.01%) were recorded as having displayed temporary dispersal (two of the five were recoveries, i.e. dead birds found ashore), eight gannets (0.01%) dispersed as sub-adults, and only one (< 0.002%, the individual reported here) was recorded as dispersing as an adult (recovery). Temporary dispersal included recaptures of gannets at locations approximately 200 km to 900 km from nesting localities, indicating likely long-distance foraging. All eight dispersal events were either between Lambert's Bay and Saldanha (n = 5) or between Saldanha Bay and Lambert's Bay (n = 3), a distance of approximately 110 km. These results indicate that dispersal events after periods of fidelity to breeding sites are likely to be very rare, and, when they do occur, are likely to be comparatively short-distance events.

The breeding and feeding ecology of Cape Gannets has evidently been strongly affected by disturbance at breeding colonies during the last decade, as well as by changes in potential prey distribution. For example, the Cape Gannet breeding colony at Lambert's Bay was completely abandoned during 2005/06 as a result of the predation of approximately 200 birds by Cape fur seals *Arctocephalus pusillus* (Wolfaardt & Williams 2006). The disturbance by fur seals was also suggested as the cause of partial abandonment of the colony during the previous breeding season (2004/05), during which the colony decreased by 50% (Crawford *et al.* 2007). However, this colony recovered as approximately 4 000 pairs of gannets returned to breed in 2006/07, increasing to 9 000 during 2007/08 (Distiller 2012).

In addition to the effect of fur seals, between 1997 and 2005 there was a progressive, eastward shift of sardine catches made by the purse-seine fishery off the South African coast (Fairweather *et al.* 2006, Roy *et al.* 2007). During this time, specifically between 2001/02 and 2005/06, the number of breeding Cape Gannets in the Western Cape Province (where Lambert's Bay is situated) decreased by 38%. The proportion of sardine in the birds' diet decreased from 40% during 1987–2003 to 5%–7% in 2005–2006 (Crawford *et al.* 2007). Crawford *et al.* (2007) also found a population increase in Cape Gannets at Bird Island, Algoa Bay, after 2002, corresponding to an increase in the proportion of sardines in their diet.

While it is unknown whether the bird we report on was breeding at Lambert's Bay before its eastward dispersal, the multiple resightings as an adult bird (i.e. > 4 years old) at that colony strongly suggest that it would have formed part of the breeding colony. Furthermore, because of the lack of records of this gannet between 2005 and 2014, we cannot confidently attribute its movement away from the Lambert's Bay colony to the seal disturbance associated with the colony abandonment of 2005/06. This disturbance is, however, highly likely to have caused the gannet's movement, considering that researchers at Lambert's Bay conduct an extensive monthly recapture effort. Also, it is unknown whether this bird was breeding in the Eastern Cape at the Bird Island Colony, since recapture effort at this colony was low after the mid-1990s (Distiller *et al.* 2012).

At Bird Island, Algoa Bay, Klages (1994) found nest-site fidelity at or close to the original nest of 71.7%, with only 8.1% of gannets moving once to another site within the same colony, followed by extended periods of faithfulness to nests. The remaining 20.2% of nest-site fidelity was inconclusive. Our observation provides an addition to these results, as well as to results obtained from the SAFRING ringing data, illustrating that these seabirds sometimes display dispersal as adults after a protracted period of nest-site fidelity.

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