

SHORT NOTE

South Georgian diving petrel (*Pelecanoides georgicus*) bones from a Maori midden on Otago Peninsula, New Zealand

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The South Georgian diving petrel (*Pelecanoides georgicus*) is a circumpolar breeder, with significant colonies on South Georgia, Heard Island, Iles Crozet, Iles Kerguelen, Marion and Prince Edward Islands (Marchant & Higgins 1990). The last remaining population in the Pacific region breeds in dunes at Sealers Bay, Codfish Island, New Zealand (Imber & Nilsson 1980), and in 2005 consisted of about 150 birds, with probably fewer than 50 breeding pairs (G. Taylor, pers. comm.). In the past 200 years, colonies of *P. georgicus* have become extinct on Enderby Island (Heather & Robertson 1996), Dundas Island (Falla *et al.* 1979) and possibly Macquarie Island (Marchant & Higgins 1990). Subfossil bones indicate that New Zealand populations of *P. georgicus* were once more widespread, with bones identified from dune deposits on Chatham Island and Mason Bay, Stewart Island (Worthy 1998). This note describes the occurrence of *P. georgicus* bones in a Maori midden at Sandfly Bay, Otago Peninsula, South Island, New Zealand.

In 2001, Department of Conservation staff discovered an eroding Maori midden at the eastern end of Sandfly Bay, Otago Peninsula (Fig.1). The site was reported to Te Runanga o Otakou, and the Ngai Tahu Development Corporation excavated the site. The midden site is registered with the New Zealand Archaeological Association site recording scheme (I44/68). Bones from at least 10 individual *Pelecanoides* were excavated from the site, representing 14.3% of the total minimum number of individual birds in the deposit (Briden 2005). Most *Pelecanoides* bones were unassociated post-cranial elements, which do not allow species level identification (Worthy 1998). However, 3 premaxillae were recovered (Fig. 2), and identified on the basis of morphological data presented by Worthy (1998). Specimen NT002 (Fig. 2) exhibits a parallel-sided bill, and a premaxilla width : length ratio of 0.945. Both features identify it as common diving petrel (*P. urinatrix*). Specimens NT001 and NT003 (Fig. 2) both have a greater degree of bill taper than NT002, and premaxilla width : length ratios of 1.044 and 1.08, respectively. Based on these features, NT001 and NT003 were identified as *P. georgicus*.

Accelerator mass spectrometry dating of bones from forest birds in the Sandfly Bay midden give ages ranging from 507 ± 35 radiocarbon years before present (B.P.) (NZA 22841) (1403 – 1476 cal. AD) to 766 ± 35 radiocarbon years B.P. (NZA 22840) (1225 – 1382 cal. AD). The latter part of this period overlaps with the *P. georgicus* colony at Mason Bay, which existed between A.D. 1338 and 1650, based on calibrated radiocarbon ages (Holdaway *et al.* 2003). Therefore, it is possible that the *P. georgicus* specimens from Sandfly Bay may have been beach-wrecked individuals originating from the Mason Bay colony. However, it is more likely they may have originated from a local colony.

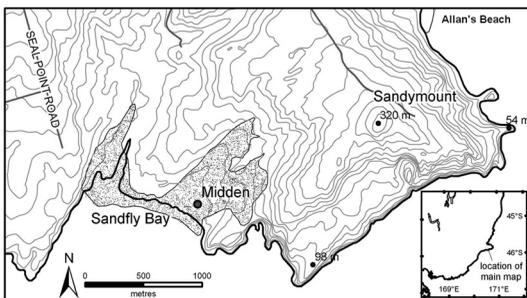


Fig. 1 Sandfly Bay, Otago Peninsula. Stippled area indicates the present extent of dune and beach sands.



Fig. 2 *Pelecanoides* premaxillae excavated from Maori midden at Sandfly Bay, Otago Peninsula. NT001 and NT003 identified as *P. georgicus*; NT002 is *P. urinatrix*.

On Codfish Island, *P. georgicus* burrow in sparsely vegetated, mobile sand dunes (Heather & Robertson 1996), while burrows on Dundas Island (Falla 1979) and bones at Mason Bay (Wood 2003) were concentrated in older, consolidated dunes. The Sandfly Bay dune system is similar to that of Mason Bay. Both consist of a modern seaward barrier of high dunes immobilised by marram grass (*Ammophila arenaria*), with older, lower, consolidated dunes and coarse, ventifacted gravel lag deposits extending inland. Although no former breeding colonies of *P. georgicus* are known from South Island, the dunes at Sandfly Bay could have provided suitable nesting habitat. The currently active dune system at Sandfly Bay extends up to 1.5 km inland to an altitude of 200 m above sea level, and covers a total area of 0.3 km². The extent of vegetated Holocene dunes indicates that the Sandfly Bay dune system formerly extended northeast to Allan's Beach and covering an area of about 4 km². However, a former colony could not be confirmed, as no *Pelecanoides* bones were found during a search of the entire Sandfly Bay dunefield in Oct 2005.

In archaeological middens, small birds tend to be represented by robust limb bones; fragile cranial elements are rarely encountered (J. Hamel, pers. comm.). However, where *Pelecanoides* cranial elements are present, these can be identified to species level. Re-examination of previously excavated bones from early middens and dunes may shed more light on the potential former distribution of *P. georgicus* breeding colonies along the New Zealand coastline.

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