SUBANTARCTIC SKUA PREY REMAINS AS AN AID FOR RAPIDLY ASSESSING THE STATUS OF BURROWING PETRELS AT PRINCE EDWARD ISLAND

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INTRODUCTION

Knowledge of the general status of the burrowing petrel population of Prince Edward Island is restricted to estimates of the burrow densities of the Blue Petrel *Halobaena caerulea* (M.Schramm unpubl. data) and incidental observations of breeding birds (Grindley 1981, Berruti *et al.* 1981). Determination of species composition and abundance of many species of petrels is complicated by their nocturnal, burrowing habits. In addition, visits to Prince Edward Island are of short duration and usually occur outside the summer breeding season and therefore do not allow the use of conventional census techniques. However, Jones (1981) and Schramm (in prep.) suggest that identification of burrowing petrels killed by Subantarctic Skuas *Catharacta antarctica*, provide a rapid assessment of the distribution and relative abundance of burrowing petrels.

This note presents the numbers and species composition of Subantarctic Skua prey remains collected at three areas at Prince Edward Island (46 38S, 37 57E) and assesses the suitability of the technique for determining the distribution and relative abundance of burrowing petrel populations.

STUDY AREA AND METHODS

All Subantarctic Skua prey remains were collected in three areas at Prince Edward Island during two short expeditions in May 1982 after the completion of the Subantarctic Skua breeding season (Fig. 1). The Kent Crater (Area 1) and Boggel (Area 2) areas are well drained slopes with a biotically influenced plant community dominated by the tussock grass *Poa cookii*. The area between McAll Kop (Area 2) and Boggel (Area 3) is a relatively flat plateau covered by *Agrostis megalanica* mire with a mixed herbfield community developed on the better drained gentle slopes.

The petrel remains generally consisted of two wings connected to the sternum and clavicle and could therefore be identified to species on the basis of wing measurements and feather colour. Where identification was uncertain, remains were classified as unidentified.

The rate of degradation of petrel carcasses was unknown. The collection probably represents the accumulation of Subantarctic Skua kills made over a number of weeks, although it is unlikely that they date back to the breeding season. Blue Petrel and Salvin's Prion *Pachyptila vittata* chicks have fledged by late January and mid-March respectively at nearby Marion Island (M. Schramm unpubl. data).

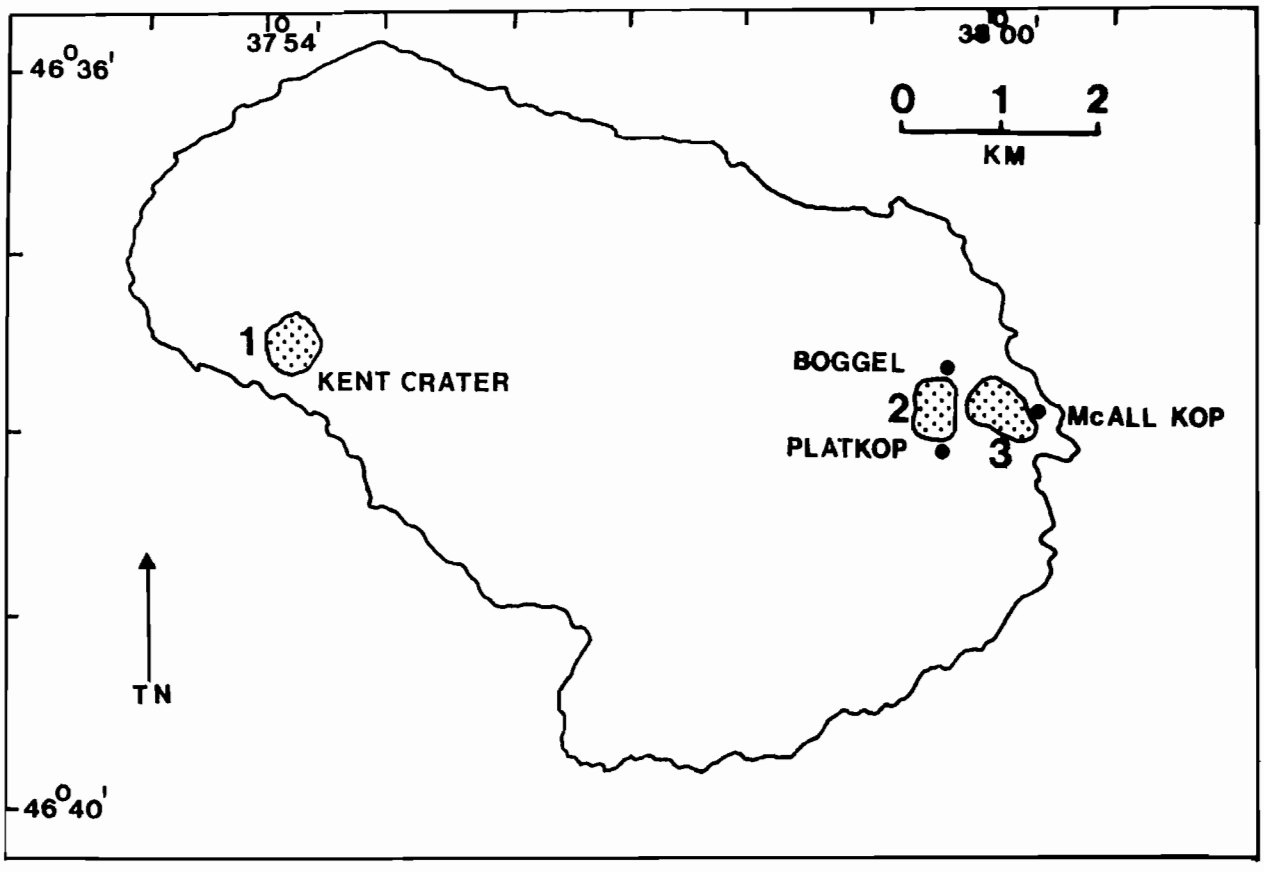
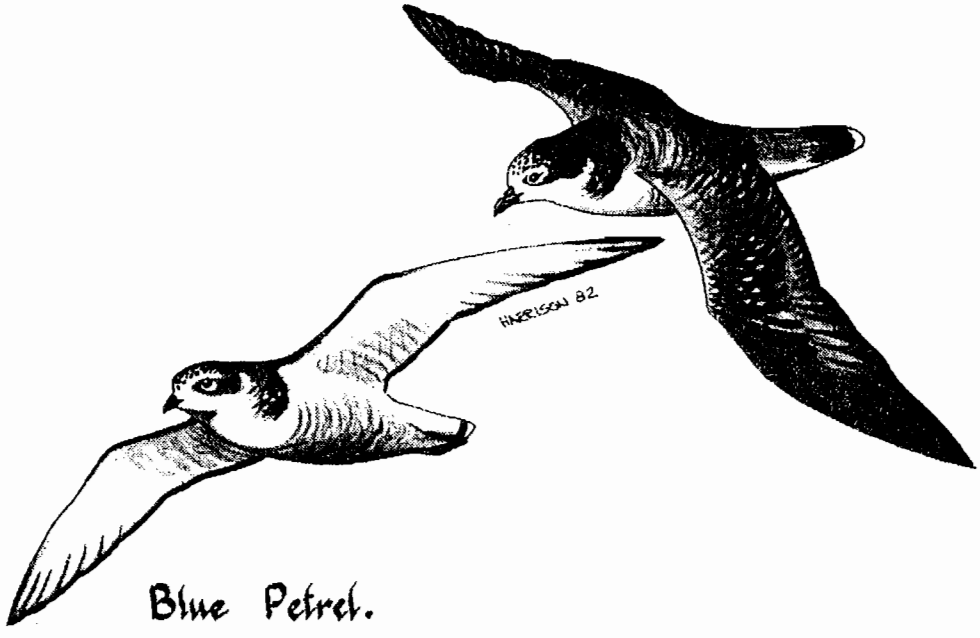


Figure 1
Location of areas from which prey remains of Subantarctic Skua *Catharacta antarctica* were collected at Prince Edward Island



Most of the remains were found along water courses around the base of slopes, rather than on the slopes themselves. Sinclair (1980) noted that the normal behaviour of single Subantarctic Skuas with petrel kills at Marion Island was to carry the bird to a small pond, seal wallow or stream before consuming it. In this respect, the method of collection differed from that of Schramm (in prep.) who collected bird remains from around Subantarctic Skua nests at Marion Island during the breeding season.

RESULTS

A total of 455 individual remains representing seven species was collected. Six of the seven species were burrowing petrels; the only other species recorded was the Rockhopper Penguin *Eudyptes chrysocome* (represented by only one item) probably scavenged from a nearby penguin colony. At two sites the Blue Petrel was the most abundant species (73 % and 76 % of individuals collected at Boggel and Kent Crater areas respectively) (Fig. 2). At the third site (McAll Kop area) the Kerguelen Petrel *Pterodroma brevirostris* was the most abundant (31 % of individuals collected) (Fig. 2). When the three sites are combined, the Blue Petrel was the most abundant species (297 individuals; 65,3 %) followed by the Kerguelen Petrel (41 individuals; 9,0 %). Unidentified material totalled 35 items (7,7 %).

DISCUSSION

Subantarctic Skuas are opportunistic feeders and prey on a number of burrowing petrel species at Marion Island (Sinclair 1980, Grindley 1981, Schramm in prep.). Differences in the diet, and hence prey remains, between localities can be attributed to differences in prey availability and therefore skua kills will be in approximate proportion to the relative abundance of the birds. These assumptions are not entirely correct since not all species are equally vulnerable to Subantarctic Skua depredation (Sinclair 1980, Schramm in prep.). Collection of prey remains was restricted to the two habitat types previously described. Areas similar to Area 1 and 2 comprised the preferred breeding habitat of the Blue Petrel at Marion Island (Schramm in prep.). This is reflected in the high relative abundance of Blue Petrel remains found at these sites (Fig. 2). Although Blue Petrels are summer breeding birds, many were still to be seen at night at Prince Edward Island in May 1982 and their presence in burrows was indicated by frequent calling (pers.obs.).

Area 3 represented a completely different habitat type. Numbers of petrel remains in this area indicated a relatively greater abundance of the summer and winter breeding gadfly petrels *Pterodroma* spp. Also notable was the presence of Whitechinned Petrel *Procellaria aequinoctialis* remains. The Whitechinned Petrel and Kerguelen Petrel are able to nest in particularly marshy areas characterized by *Agrostis megalanica*. However, fewer remains were found, suggesting a lower abundance of burrowing petrels than in the other two areas.

The relatively few prion remains collected in all three areas is surprising. Salvin's Prion is thought to be the most numerous

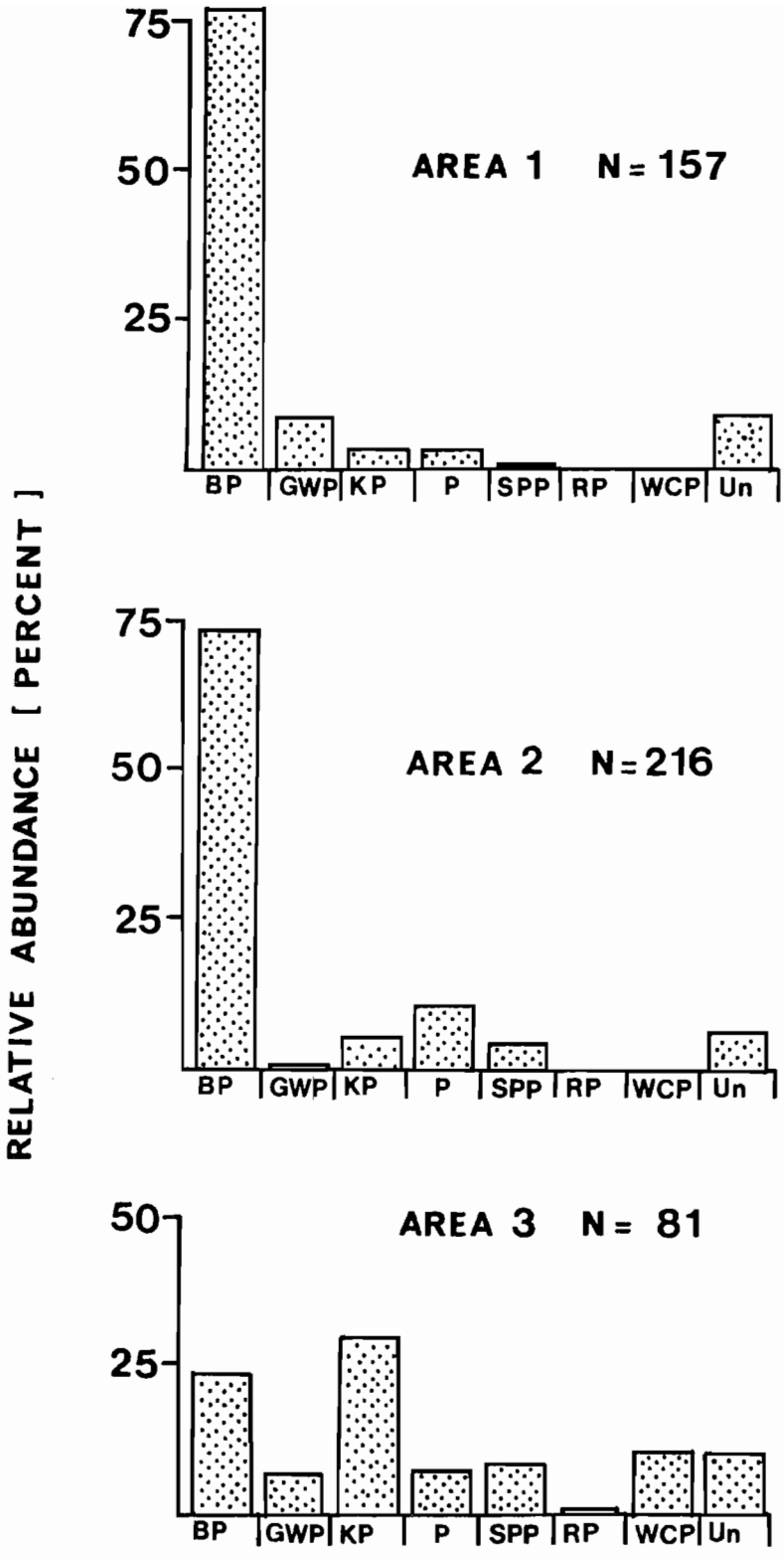


Figure 2

Relative abundance of bird species comprising Subantarctic Skua *Catharacta antarctica* prey remains in three areas at Prince Edward Island. BP, Blue Petrel *Halobaena caerulea*; GWP, Greatwinged Petrel *Pterodroma macroptera*; KP, Kerguelen Petrel *P. brevirostris*; P, Prion *Pachyptila* spp.; SPP, Softplumaged Petrel *Pterodroma mollis*; WCP, Whitechinned Petrel *Procellaria aequinoctialis*; RP, Rockhopper Penguin *Eudyptes chrysocome*; Un, Unidentified.

petrel on nearby Marion Island (Williams *et al.* 1979). This may also be true of Prince Edward Island which is only 22 km from Marion Island and physiognomically very similar. However, the highest breeding concentrations of Salvin's Prion at Marion Island occur in inland black lava areas, dominated by *Blechnum penna-marina*, *Azorella selago* and *Acaena adscendens* (M. Schramm unpubl. data). Similar areas at Prince Edward Island were not covered in this study, which may account for the low number of prion remains collected.

Of the species of burrowing petrels known to breed on Prince Edward Island (see Berruti *et al.* 1981) the Grey Petrel *Procellaria cinerea*, Blackbellied Stormpetrel *Fregetta tropica*, Greyrumped Stormpetrel *Garrodia nereis*, South Georgian Divingpetrel *Pelecanoides georgicus* and Common Divingpetrel *P. urinatrix* were not detected in the prey remains collected. The Grey Petrel is a large, aggressive bird and is only rarely preyed upon by Sub-antarctic Skuas (Sinclair 1980). The Grey Petrel was uncommon on Marion Island even before the large-scale proliferation of cats (Rand 1954, Van Aarde 1979). The stormpetrels and divingpetrels are summer breeders (Rand 1954, Watson 1975, Berruti *et al.* 1981) and were not in evidence at Prince Edward Island in May 1982. Moreover, as with the prions, their preferred nesting habitats were not covered by this collection.

The distribution of burrowing petrel species of Prince Edward Island can be broadly correlated with preferred nesting habitat and identification of prey remains can provide information on the approximate densities of the species within these areas. The use of prey remains as indicators of abundance and species composition is restricted to species of burrowing petrels vulnerable to Subantarctic Skua depredation and may be subject to bias if individual skuas within localized areas show prey specialization. Such specialization has been observed for the closely related Great Skua *Catharacta skua* in the northern hemisphere (Furness 1979). It is suggested that a better indication of the relative densities of burrowing petrel species may be obtained by determining the search effort, expressed as remains found per unit time within a particular area. The collection was restricted to three areas representing two habitat types. In order that a more general picture of the distribution and relative abundance of burrowing petrels at Prince Edward Island be obtained, coverage of all habitat types is still needed.

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