

## HAVE GIANT PETRELS *MACRONECTES* SPP. REALLY INCREASED AT ILES CROZET?

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In a recent paper, Voisin (1988) provided extensive data on the breeding biology of Northern Giant Petrels *Macronectes halli* and Southern Giant Petrels *M. giganteus* at îles Crozet, Southern Indian Ocean. This author also proposed that a sharp increase in the breeding populations of these two species on one island had occurred (respectively  $\times 1.8$  and  $\times 3.1$  in seven years). We wish to comment here on this proposal. We believe that we are in position to do this, because our group counted the populations of both species of giant petrels in 1980; a count that forms the basis of Voisin's proposal of an increase in numbers.

Our first concern relates to the way in which the breeding populations were estimated. According to Voisin (1988, p. 67) where total counts of the île de la Possession population were not available (*i.e.* in all cases but 1980), populations were estimated from banding files of fledglings (but not all chicks were banded every year), assuming that fledging success is around 40% at îles Crozet. However, the figure of 40% is very unreliable, as it is highly variable between years (Voisin 1988, 30% to 88%, Fig. 7, p. 86; Hunter 1984). Furthermore, according to Voisin (1988, Fig. 8, Table 15, p. 89), there were only 48 pairs in the so-called "eastern colonies" in 1980. We counted all the incubating birds in these colonies in 1980 (Jouventin *et al.* 1984), and found a total of 71 breeding pairs (ironically, all these data were sent to Voisin); thus Voisin's estimates, based on a combination of banding files and actual counts (Table 15, p. 88, footnote "b"), were underestimates of *c.* 50%. More importantly, in 1980, three new colonies were discovered and counted for the first time, simply because these areas had never been visited before (*e.g.* Pointe des Moines: Jouventin *et al.* 1982).

Voisin stated himself this point in Table 3 (p. 71: Localities 522, 870 and 960, Voisin 1988). These three colonies alone account for an increase of 225 pairs compared to the 1977 data. Thus, the "huge" increase (330 to 650 pairs from 1977 to 1980) is explained by i) the discovery of new colonies, and ii) the use of more precise counts of eggs, rather than of banded fledglings. Even if we compare 1977 to 1973 counts (another sharp increase in Voisin's Fig. 8), the former was the first year when a precise count of the "western" colonies was conducted (see column "total" of Table 15).

Lastly, we would like to question the validity of Voisin's count of 1966: according to Voisin himself (Voisin 1968, p. 96, Voisin 1969, p. 84) he did not visit the northwestern part of the island during that year. Moreover, the previous biologists who visited îles Crozet before 1966 (*e.g.* Dreux 1962, Milon 1962) did not visit that part of île de la Possession, so that only the eastern and southwestern colonies were known at that time. Especially, the northwestern colony of "Pointe Basse" (200 pairs in 1980), a mixed colony with Wandering Albatrosses *Diomedea exulans*, was discovered by J.L. Mougin in 1968 (Mougin 1970); how then, can Voisin give a figure for the whole island in 1966?

Giant petrel populations are thought to have sharply increased on the whole of îles Crozet (Voisin 1988), in contrast to nearly all other sub-Antarctic and Antarctic colonies (Thomas 1986, Rootes 1988, Jouventin & Weimerskirch 1990, in press, Woehler *et al.* 1990, Woehler in press, Woehler & Johnstone in press). Giant petrels are known to be very wary species, susceptible to human presence (Woehler *et al.* 1990). Voisin (1988) himself wondered how the increase at île de

la Possession accorded with his data on breeding biology dispersion and demography (p. 92). May we suggest that the best answer to that question is precisely that giant petrel populations were stable (if not decreasing, but certainly not increasing) between 1966 and 1980 at île de la Possession. This would fit better with our exhaustive counts on île de la Possession in the last ten years, which were all based on incubating birds, and which showed that the Northern Giant Petrel *M. halli* had decreased from 560 to 400 pairs and the Southern Giant Petrel *M. giganteus* from 84 to 64 pairs between 1980 and 1988 (Jouventin & Weimerskirch 1990, in press).

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