

Breeding season of Kermadec Petrels (*Pterodroma neglecta neglecta*) at Meyer Islands, Kermadec Group, New Zealand

Kermadec Petrels (*Pterodroma neglecta neglecta*) were formerly very abundant on Raoul Island (29° 16' S, 177° 55' W), Kermadec Group, where the vast majority laid in spring (about November) (Oliver 1955). On the Meyer Islands and others adjacent to Raoul Island, most birds were recorded as breeding in autumn through winter (Oliver 1955). The Raoul Island population was essentially extinct by 1966 due to predation by feral cats (*Felis catus*) and rats (*Rattus norvegicus* and *R. exulans*) (Merton 1970).

Kermadec Petrels are present at the Meyer Islands, Kermadec Group, at all times of the year. Observations made on the Meyer Islands of this surface-nesting petrel, where there was some indication of numbers present and stage of the breeding cycle, are summarised month by month as follows:

January. The 1966/67 OSNZ party (Merton 1970) recorded increasing numbers reaching 106 occupied nests in the 0.8 acre study area by 25 January 1967. This was equated to 5000 pairs on the Meyer Islands at that time and numbers were observed to still be increasing with peak laying predicted to be after the end of January. Only 25 chicks were observed on North Meyer Island on 20 January 1967 (Merton 1970). No chicks were observed in 1994 (GH).

February. On 29 February 1908, Iredale (1914) observed that one in every five birds was sitting on an egg.

March. All the nesting birds observed on 13 March 1994 were on eggs (GH). Clark made a similar observation in March 1963 (C. Clark, unpublished).

April. By 10 April 1994 a small number of very young chicks were present although most birds were still on eggs (GH). On 14 April 1929, Guthrie-Smith (1936) found incubation was in progress and he saw a week-old chick. Smuts-Kennedy (1973) observed on 15 April 1973 that Kermadec Petrels were breeding all over North Meyer Island, some with eggs, some with young chicks, and some just sitting on the ground.

May. No recorded observations.

June. On 13 June 1994 adults were either establishing nest sites or courting (GH). Many hundreds of flying Kermadec Petrels were noted on 19 June 1994. On the ground, most adults were on empty or new nests, but there were a few with eggs. Chicks, none of which were attended by adults, ranged from medium-sized downy young to larger young with feathers beginning to show (GH).

July. On 12 July 1994 adults were attending chicks at various stages of development from downy to almost fledged (CRV). By 22 July 1994 the adults present had decreased by 50% over the previous four weeks, but there were still many adults sitting around without any apparent occupation. Chicks were still present (GH). Davison (1938) found well-grown young in July 1937.

August. Morrison (1979) noted that most chicks were downy but others were near fully fledged on 8 August 1977. In August 1944, Sorensen (1964) found fledglings ready to fly, downy chicks, and one bird still incubating. By 20 August 1994, the adults that were present in June had departed and chicks noted earlier were losing their down (CRV).

September. On 13 September 1963, Clark (C. Clark, unpublished) noted that there were still some chicks not fully feathered. In September 1972, moderate numbers of chicks were present. No adults with eggs were seen and chicks varied from large and downy to almost fully fledged (CRV).

October. The majority of adults present on 8 October 1993 were attending downy chicks (GH). Most of the chicks noted by Morrison (1979) in August 1977 had gone by 12 October 1977. In late October 1995 David Lawrie and Hugh Clifford (pers. comm.) recorded a few adult birds, fully feathered juveniles and one chick which was still showing some down.

November. The 1966/67 OSNZ party (Merton 1970) found on 19 November 1966 that some Kermadec Petrels had laid and several young were present, one of which was almost able to fly. In two hours ashore on 20 November 1964 Edgar *et al.* (1965) found three Kermadec Petrel nests: one a new nest and two with fresh eggs.

December. Of 24 nesting pairs in the Camp Flat study area on 13 December 1966, only two had eggs and only seven chicks were found over the whole of North Meyer Island (Merton 1970).

This short note shows that there are no consistent observations throughout a whole year; no comparable data between observers or between years; no definite records of a total absence of eggs or chicks at any time and no records of the total number of birds present in any given area at any given time. It is, however, possible to see that there is a pattern of nesting. A major period of egg laying begins in November, reaches a peak in February/March and continues into June. There are pairs on eggs through much of the year, but outside the main period of egg laying this appears to be a small portion of the population. There are no data recording whether these are freshly laid eggs or extended incubation of failed eggs.

Incubation and fledging times are not precisely known but have been stated as incubation of 50-52 days (Oliver 1955) and a nestling period of 110 to 130 days (Rogers 1990). However, Rogers (1990) states that this nestling period is estimated from data given by Iredale (1914) who, in the paper cited by Rogers, wrote "four months would seem to elapse between the date of laying and flight of the young".

First time observers of Kermadec Petrels at this location who are unaware of possible maximum or minimum numbers, can reach inappropriate conclusions on abundance of the nesting population. Some of the birds recorded as "adult" may have been fully feathered young. It is not known whether Kermadec Petrels breed annually or biennially and hence whether the obvious influx of adult birds observed in June/July 1994 is a gathering of young birds as has been observed in other petrel

species (CRV pers. obs., M.J. Imber pers. comm.) or early pre-breeding behaviour of next year's breeders.

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LITERATURE CITED

- DAVISON, E.B. 1938. Unpublished report on plant, animal and birdlife of Raoul Island. Appendix C. of aeradio committee report to the Under-Secretary, Public Works Department, Wellington.
- EDGAR, A.T.; KINSKY, F.C.; WILLIAMS, G.R. 1965. The Kermadec expedition 1964. *Notornis* 12: 3-43.
- GUTHRIE-SMITH, H. 1936. Sorrows and joys of a New Zealand naturalist. Coulls, Somerville, Wilkie, Ltd., Dunedin.
- IREDALE T. 1914. The surface breeding petrels of the Kermadec Group. *Ibis* 2: 423-436.
- MERTON, D.V. 1970. Kermadec Islands expedition reports: A general account of birdlife. *Notornis* 17: 147-199.
- MORRISON, K. 1979. Bird observations on North Meyer Islet. *Notornis* 26: 317.
- OLIVER, W.R.B. 1955. *New Zealand birds*. Reed, Wellington.
- ROGERS, D.I. 1990. *Pterodroma neglecta* Kermadec Petrel. Pp. 436-440. *in*: Marchant, S., Higgins, P.J. (Co-ordinators) *Handbook of Australian, New Zealand & Antarctic Birds, Vol. 1. Ratites to ducks*. Oxford University Press, Melbourne.
- SMUTS-KENNEDY, J.C. 1973. Raoul Island goat and cat eradication : 30/3 - 23/7/73. Unpublished report to Controller, Wildlife Service, Wellington. Wildlife Service file 30/3/13.
- SORENSEN, J.H. 1964. Birds of the Kermadec Islands. *Notornis* 11: 69-81.

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