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THE BREEDING ECOLOGY OF THE  
NORTH ISLAND LITTLE SHEARWATER,  
*Puffinus assimilis haurakiensis*.

A thesis presented in partial fulfilment  
of the requirements for the degree of

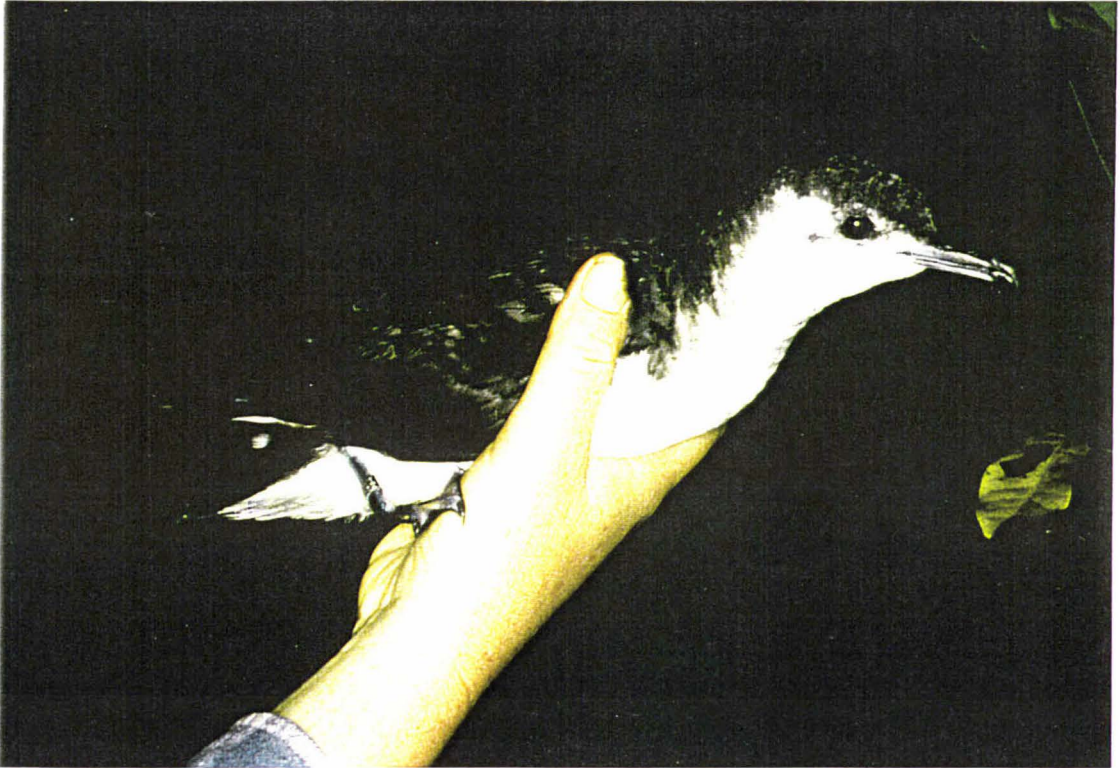
Master of Science in Ecology

at Massey University.

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*Frontispiece:* North Island Little Shearwater (*Puffinus assimilis haurakiensis*),  
Lady Alice Island, Hen and Chickens Group, New Zealand, 1994.

## ABSTRACT

The breeding ecology of the North Island Little Shearwater *Puffinus assimilis haurakiensis* was investigated on Lady Alice Island, Hen and Chickens Group, Northland, New Zealand, during the 1994 breeding season.

The Little Shearwater showed a high degree of intra-population asynchrony in laying compared to other procellariiform species. This suggests that there is not an optimum time for laying in this species, and that laying is influenced by a low variability in the food supply during the breeding season.

The behaviour of Little Shearwater breeding adults was monitored throughout the chick rearing period. Chicks were fed, on average, on 96% of nights. This result is not compatible with the theory that large fat deposits in procellariiform chicks are an adaptation to a fluctuating food supply.

Parents coordinated their feeding sessions, with one bird at a time feeding the chick for approximately seven night in a row. This strategy may result in less variation in the food provisioning rate compared with records for other Procellariiformes, in which adults forage independently. If this is so, coordination of foraging sessions does not support the hypothesis that fat deposits in Little Shearwater chicks provide insurance against variation in the food delivery rates of parents. Coordination of foraging shifts may allow adults to obtain more accurate information about the nutritional status of the chick, and therefore regulate meal size according to chick requirements. Little Shearwater chicks lost a smaller proportion of their body mass between obtaining maximum chick mass and fledging (17.7%), than other species in the family Procellariidae. This observation is compatible with adults regulating the amount of food delivered to chicks. Adults do not appear to feed chicks at the maximum rate possible for parents, as has been suggested for species which forage independently. Further research is required to determine the factors influencing both fat deposition in chicks, and adult foraging behaviour in the Little Shearwater.

Little Shearwater burrows were monitored throughout the breeding season for signs of predation by kiore, *Rattus exulans*. Direct evidence of kiore predation of eggs was obtained by timelapse video. The breeding success rate of Little Shearwaters was 38% (n = 29), The majority of breeding failure occurred during incubation, with 16 (89%) of the 18 unsuccessful nests failing at this stage. Kiore predation of eggs was the suspected cause of failure for at least 12 (75%) of the nests which failed at incubation. The long-term impact of kiore predation on the Little Shearwater, and the implications of these findings for management, are discussed.

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