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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

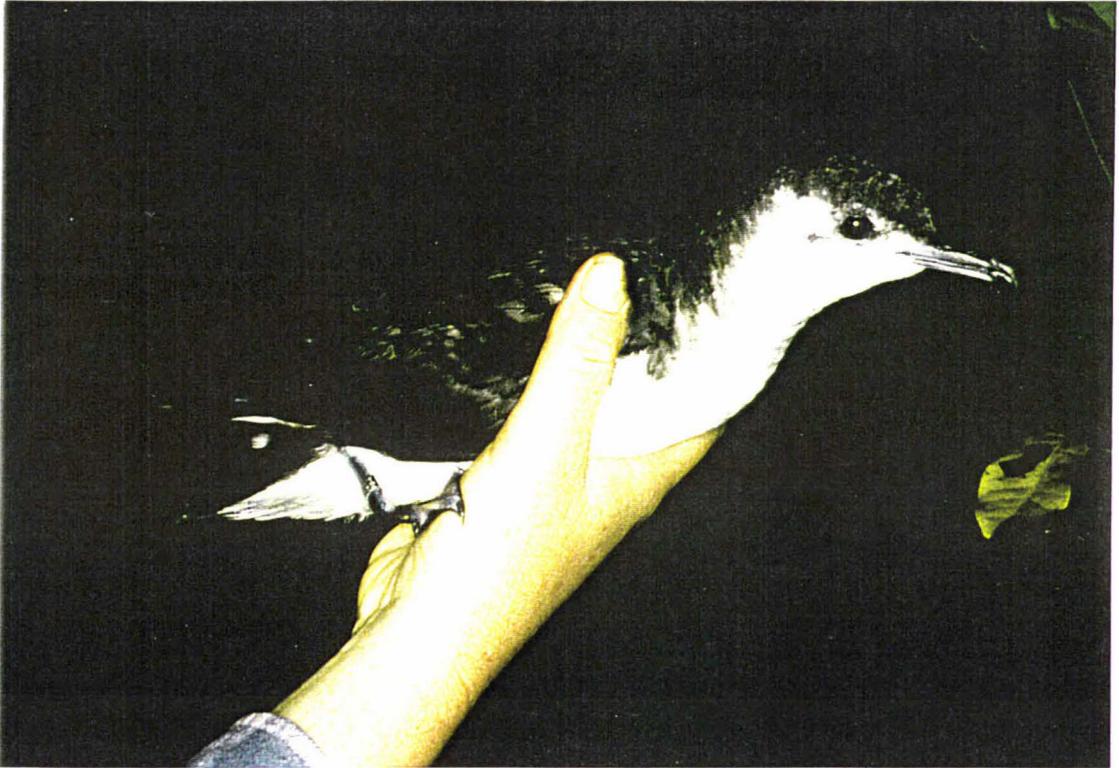
Master of Science in Ecology

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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TABLE OF CONTENTS

Frontispiece.....	ii
Abstract.....	iii
Acknowledgements	iv
Table of Contents.....	v
List of Figures	vii
List of Tables	viii
List of Plates	ix
 Chapter One: Introduction	
1.1 General Introduction.....	1
1.2 Thesis Objectives.....	1
1.3 Thesis Organisation	2
1.4 Distribution and Status.....	3
1.5 Description	3
1.6 Breeding Ecology	4
1.7 Study Site.....	4
1.8 References.....	9
 Chapter Two: The Pre-laying Behaviour and Incubation Period of the Little Shearwater	
2.1 Introduction	11
2.2 Methods.....	12
2.2.1 Study site	
2.2.2 Pre-laying behaviour	
2.2.3 Incubation	
2.2.4 The Effects of Investigator Disturbance	
2.3 Results	14
2.3.1 Pre-laying period	
2.3.2 Incubation	
2.3.3 The Effects of Investigator Disturbance	
2.4 Discussion.....	25
2.5 References.....	28

Chapter Three: The Chick Rearing Stage of the Little Shearwater	
3.1 Introduction	31
3.2 Methods.....	32
3.2.1 Study site	
3.2.2 Chick growth rates and weights	
3.2.3 Adult food provisioning	
3.3 Results	33
3.3.1 Chick hatching	
3.3.2 Chick brooding	
3.3.3 Chick growth	
3.3.4 Adult feeding behaviour	
3.3.5 Effects of investigator disturbance	
3.4 Discussion.....	39
3.5 References.....	43
 Chapter Four: Little Shearwater Breeding Success, and Evidence of Predation by Kiore, <i>Rattus exulans</i>	
4.1 Introduction	46
4.2 Methods.....	47
4.2.1 Study Site	
4.2.2 Monitoring burrows for causes of failure	
4.2.3 Obtaining evidence of kiore predation	
4.3 Results	48
4.3.1 Little Shearwater breeding success	
4.3.2 Causes of breeding failure	
4.3.3 Timing of breeding failure	
4.3.4 Causes of breeding failure at each study site	
4.3.5 Breeding failure in relation to time eggs were left unattended	
4.3.6 Evidence of kiore predation of Little Shearwater eggs	
4.3.7 Sign left by kiore on Little Shearwater and domestic hen eggs	
4.4 Discussion.....	54
4.5 References.....	56
 Chapter Five: Summary and Conclusions.....	59
 Appendix A.....	63

LIST OF FIGURES

- 1.1: Location of Lady Alice Island, Hen and Chickens Group, in relation to Whangarei, Northland, New Zealand.
- 2.1: Location of study sites on Lady Alice Island.
- 2.2: Timing of Little Shearwater breeding activity during the pre-laying and incubation periods.
- 2.3: Distribution of Little Shearwater egg laying dates.
- 2.4: Dimensions of Little Shearwater eggs.
- 2.5: Proportion of weight change of Little Shearwater eggs during incubation.
- 2.6: Egg volume index of Little Shearwater eggs in relation to laying date.
- 2.7: Little Shearwater male and female weights at the start of each incubation shift.
- 2.8: Little Shearwater male and female weights at the end of each incubation shift.
- 3.1: Location of study sites on Lady Alice Island.
- 3.2: Timing of Little Shearwater breeding activity during the chick rearing period.
- 3.3: Mass of Little Shearwater chicks in relation to age.
- 3.4: Rates of growth of the bill, mid toe + claw, tarsus and wing of Little Shearwater chicks.
- 3.5: Overnight mass change of Little Shearwater chicks.
- 3.6: Overnight weight increase of Little Shearwater chicks in relation to age.
- 3.7: Percentage of nights that Little Shearwater chicks were fed in relation to age.
- 4.1: Location of study sites on Lady Alice Island.
- 4.1: Kiore removing Little Shearwater egg from the nesting chamber.

LIST OF TABLES

2.1: Length of each shift during the Little Shearwater incubation period, and weight loss of birds for which a complete incubation shift was recorded.

2.2: The number of Little Shearwater eggs left temporarily unattended during each week after laying, and the average number of days eggs were left unattended during each week.

2.3: Visits by Little Shearwater adults to burrows after breeding failure.

3.1: Comparison of methods used to determine whether Little Shearwater chicks were fed.

4.1: Causes and timing of Little Shearwater breeding failure.

4.2: Comparison between sites of causes of breeding failure, and overall breeding failure of Little Shearwaters.

4.3. Percentage of days Little Shearwater eggs were left unattended at each study site.

LIST OF PLATES

- 1.1: Vegetation type at the Hut Site (site 1), Lady Alice Island.
- 1.2: Vegetation type at the Gully Site (site 2), Lady Alice Island.
- 1.3: Vegetation type at the Ridge Site (site 3), Lady ALice Island.
- 1.4: Vegetation type at the Pa Site (site 4), Lady Alice Island.
- 2.1: Little Shearwater burrow entrance, Lady Alice Island, June 1994.
- 4.1: (a): Remains of Little Shearwater egg which was filmed being removed from the nesting chamber by a kiore.
- 4.1: (b): Remains of domestic hen egg placed in a cage with captive kiore.
- 4.2: Kiore incisor marks on Little Shearwater egg in Plate 4.1(a).