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# The Epidemiology of the Free-Roaming Dog and Cat Population in the Wellington Region of New Zealand

A dissertation presented  
in partial fulfilment of the requirements  
for the degree of Master of Veterinary Studies  
at Massey University

Karma Rinzin  
2007

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(Submitted April 30, 2007)

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## Abstract

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We present analyses of details of dog and cat submissions to the Wellington Society for the Prevention of Cruelty to Animals shelter from July 1999 to February 2006. Our aims were to document the demographic, temporal, and spatial characteristics of the free-roaming and surrendered dog and cat population in the SPCA catchment area. The motivation for this research was to identify factors determining population growth which should in turn provide a more quantitative basis for refining strategies to control the number of free-roaming dogs and cats in this area of New Zealand.

Throughout the study period a total of 3992 dogs and 14343 cats were submitted to the Wellington shelter. On average, 11 dogs (range 1 – 41) and 40 cats (range 3 – 104) were presented to the shelter in any given week. Approximately one half (2065 of 3978, 52%) of the dogs and three quarters of the cats (10431 of 14323, 73%) were classified as free-roaming (that is, animals that were wild, stray, abandoned, or lost). The age structures of submitted dogs and cats were skewed towards younger age groups (< 12 months) with little difference between sexes. A higher proportion of surrendered animals were desexed (16% dogs, cats 22%) compared with those presented as free-roaming (dogs 4%, cats 15%).

The number of free-roaming dogs and cats presented to the shelter each year steadily decreased from 1999 to 2005. A total of 333 free-roaming dogs and 1637 free-roaming cats were presented to the shelter in 2000, compared with 154 dogs and 1298 cats in 2005. A clear seasonal pattern was evident for cat submissions with large numbers presented to the shelter from October to May in any given year with a peak in December and January.

A subset of the Wellington SPCA catchment area was defined and kernel smoothing techniques used to plot the spatial distribution of the residence of members of the public who submitted animals to the shelter throughout the study period. We found a positive relationship between the number of households submitting animals to the shelter and mesh block level deprivation index.

Leslie projection matrices were used to quantify the intrinsic rate of growth of the free-roaming dog and cat population. The intrinsic rate of population growth was 0.78 (95% CI 0.56 – 0.94) for dogs and 0.98 (95% CI 0.76 – 1.16) for cats. Assuming the intensity of recruitment of animals to the shelter was constant throughout the study period these findings indicate negative growth in the free-roaming dog population and little or no growth in the free-roaming cat population. Elasticity analyses allowed us to distinguish those factors that were most influential in determining population growth. The intrinsic rate of population growth was sensitive to changes in the submission and fecundity rates of younger animals (those less than 2 years of age) with each measure being approximately equally influential in terms of the overall effect on population growth.

The studies presented in this dissertation demonstrate that submission of younger animals to the shelter (with subsequent re-homing) and/or submission and desexing (with subsequent release) are equally effective techniques for limiting the growth of the free-roaming dog and cat population in the Wellington region. Areas defined as socio-economically deprived should be targeted for intervention. June to September would be an appropriate time of the year to intensify control efforts, particularly for cats.

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## Acknowledgements

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I have been very fortunate in being able to do my Master of Veterinary Studies at the EpiCentre, Massey University, one of the premier international veterinary epidemiology institutes. Working with this dynamic group of professionals has greatly broadened my understanding of and improved my skills in epidemiology. For this I would sincerely like to thank the following staff and students: Roger Morris, Nigel French, Cord Heuer, Naomi Cogger, Jutta Tebje-Kelly, Helen Benerd, Jo McKenzie, Ed Peeler, Eric Neumann, Colleen Blair, Julie Dunlop, Simon Verschaffelt, Solis Norton, Diane Richardson, Christine Cunningham, Deb Prattley, Eve Pleydell, Kevin Lawrence, Jackie Benschop, Simone Titus, Patricia Jaros, Caryl Lockhart, Thibaud Porphyre, Sina Taulealo, Kamaliah Ghazali, Shaheed Haneef, Bernard Phiri, Juana Bianchini, Jamie Glossop, Ange Bissielo, Laclan McIntyre, Greg Bolton, Bryan O'Leary, Masood Maumoon, and Nicolai Moles-Benfell.

I would like to express my profound gratitude to my supervisor, Mark Stevenson, who has always been willing to share his wealth of knowledge with me. I am truly indebted to him for his vision and all the input he provided for this dissertation. Nigel French and Ron Jackson were indispensable in the assistance provided on many aspects of my work.

I would like to thank the staff of the Wellington SPCA, particularly Judi Weir, David Probert, and Robert Bird. I am grateful for them making available the data that has been used for this study as well as for sparing their valuable time to provide other useful information at various stages of this project.

Thanks are to Heikko Wittmer for his insights into the ecological modeling aspects of this work (Chapter 5) and to Robert Sanson for geocoding the residential addresses of the animal submitters (Chapter 4).

I am grateful to the New Zealand Agency for International Development (NZAID) for funding my studies at Massey University. I would also like to extend my gratitude to the management of Department of Livestock and the Royal Government of Bhutan for

supporting my candidature and for allowing me to undertake this study.

I owe special thanks to Ron and June Jackson, Mariusz Skorupski, and Joanna Olzack for the care and concern shown to me and my family throughout our stay in New Zealand. I would also like to thank my friend Sithar Dorjee and his family for their company and help during the crucial first year of our stay in New Zealand.

I acknowledge the support and encouragement received from my family members and friends in Bhutan. Finally, I would like to thank my dear wife Pema, my son Jigme and my daughter Yiwong for accompanying me to New Zealand and for their patience, support and love during this time.

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# Nomenclature

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GIS	Geographic Information System
GnRH	Gonadotrophin releasing hormone
FAO	Food and Agriculture Organization of the United Nations
FSH	Follicle stimulating hormone
LH	Luteinising hormone
NZSPCA	New Zealand Society for the Prevention of Cruelty for Animals
OIE	Office International des Épizooties
SPCA	Society for the Prevention of Cruelty for Animals
WHO	World Health Organization
WSPA	World Society for the Protection of Animals



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## List of Publications

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Rinzin, K., Stevenson, MA., Tebje-Kelly, Tshering, P., & Tenzin. (2007). Descriptive spatial and temporal epidemiology of rabies in Bhutan. *Proceedings of the 11th International Symposium on Veterinary Epidemiology and Economics 2006, Cairns Convention Centre, Queensland, Australia, 6-11 August 2006*, VetLearn, Massey University, Palmerston North.

Rinzin, K., Stevenson, MA., Probert, D., Jackson, R., French, NP., & Weir, J. (2006). Descriptive epidemiology of free-roaming dogs and cats in the Wellington region. *Institute of Veterinary, Animal and Biomedical Sciences Research Colloquium 2006, Massey University, Palmerston North, 12 December 2006*, 13–14.

Rinzin, K., Stevenson, MA., Probert, D., Robert, B., Jackson, R., French, NP., & Weir, J. (2007). Population dynamics of free-roaming dogs and cats in the Wellington region: implications for control. *Epidemiology and Animal Health Management Seminar 2007, Massey University, 26 – 27 February 2007*, VetLearn, Massey University, Palmerston North, 259, 73–74.



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# Contents

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<b>Abstract</b>	<b>iii</b>
<b>Acknowledgements</b>	<b>v</b>
<b>Nomenclature</b>	<b>vii</b>
<b>List of Publications</b>	<b>ix</b>
<b>1 Introduction</b>	<b>1</b>
<b>2 A Review of Dog and Cat Ecology</b>	<b>3</b>
2.1 Introduction . . . . .	3
2.2 Problems associated with free-roaming dogs and cats . . . . .	5
2.3 Control of free-roaming dogs and cats . . . . .	8
2.3.1 Control of survivorship . . . . .	8
2.3.2 Habitat control . . . . .	9
2.3.3 Legislative measures . . . . .	9
2.3.4 Control of reproduction . . . . .	10
<b>3 Models of Population Growth</b>	<b>17</b>
3.1 Introduction . . . . .	17
3.2 Modelling population growth . . . . .	17
3.3 Parameters for population models . . . . .	19
3.3.1 Total population size . . . . .	19
3.3.2 Sex ratio . . . . .	22
3.3.3 Age structure . . . . .	22
3.3.4 Survival . . . . .	25
3.3.5 Reproductive rates . . . . .	27

3.4	Population models for dogs and cats . . . . .	29
3.4.1	The Leslie matrix . . . . .	29
3.4.2	The Lefkovitch modification of the Leslie matrix . . . . .	30
3.4.3	Estimation of population size using demographic data . . . . .	31
3.4.4	Compartmental models . . . . .	32
3.4.5	Other models . . . . .	33
3.5	Conclusion . . . . .	34
<b>4</b>	<b>A description of the free-roaming dog and cat population</b>	<b>35</b>
4.1	Introduction . . . . .	35
4.2	Materials and methods . . . . .	36
4.3	Results . . . . .	38
4.4	Discussion . . . . .	48
<b>5</b>	<b>Population dynamics of free-roaming dogs and cats</b>	<b>51</b>
5.1	Introduction . . . . .	51
5.2	Materials and methods . . . . .	52
5.3	Results . . . . .	55
5.4	Discussion . . . . .	66
<b>6</b>	<b>General discussion</b>	<b>69</b>
6.1	The SPCA data . . . . .	70
6.2	Control in developing countries . . . . .	71
	<b>Bibliography</b>	<b>75</b>

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## List of Figures

---

4.1	Map showing the boundaries of the suburbs that comprise the greater Wellington region. . . . .	40
4.2	Line plot showing the number of cats and dogs presented to the SPCA shelter as a function of calendar date. . . . .	41
4.3	Frequency histograms showing the numbers of dogs and cats presented to the SPCA shelter by calendar month, stratified by age. . . . .	42
4.4	Image plots showing the number of humans and the number of dog and cat submissions per square kilometre ( $\times 1000$ ) throughout the Wellington study area. . . . .	43
4.5	Scatterplot showing the density of dog and cat submissions as a function of the human population density. . . . .	44
4.6	Miramar study area showing block level deprivation index, block level land use and image plot showing the density of residences submitting dogs and cats to the Wellington SPCA shelter. . . . .	45
4.7	Box and whisker plot showing the number of locations submitting dogs and cats to the Wellington SPCA shelter per square kilometre as a function of mesh block deprivation index. . . . .	46
4.8	Box and whisker plot showing the number of locations submitting dogs and cats to the Wellington SPCA shelter per square kilometre as a function of mesh block land use classification. . . . .	47
5.1	Map showing the boundaries of the suburbs that comprise the greater Wellington region. . . . .	61
5.2	Population pyramids showing the age and sex distribution of dogs and cats submitted to the Wellington SPCA shelter. . . . .	62

5.3	Instantaneous hazard of submission for free-roaming dogs and cats submitted to the Wellington SPCA shelter. . . . .	63
5.4	Line plots showing the actual and projected numbers of free-roaming animals in the Wellington region. . . . .	64
5.5	Error bar plots showing the elasticity of the intrinsic rate of population increase in response to changes in age-specific survival and fecundity rates. . . . .	65

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## List of Tables

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2.1	Classification of the status of dogs and cats based on the level of supervision imposed. . . . .	4
2.2	Major zoonoses acquired from dogs and cats. . . . .	6
2.3	Surgical methods for the control of reproduction in dogs and cats. . . .	12
2.4	Non-surgical methods available for control of reproductive functions in dogs and cats. . . . .	13
3.1	Estimated densities of free-roaming and owned dogs and cats, ratio of dogs and cats to humans, and proportion of the dog and cat population that were male. . . . .	23
3.2	Mean age and estimated age structure of owned and free-roaming dog and cat populations. . . . .	25
3.3	Structure of a single decrement life table. . . . .	27
3.4	Proportion of intact females, estimated number of litters, litter size, and fertility rate in free-roaming, relinquished, and owned dog and cat populations. . . . .	28
5.1	Population demographic characteristics of dogs and cats submitted to the Wellington SPCA shelter. . . . .	57
5.2	Reproductive status of free-roaming dogs greater than 3 months of age submitted to the Wellington SPCA shelter. . . . .	58
5.3	Reproductive status of free-roaming cats greater than 3 months of age submitted to the Wellington SPCA shelter. . . . .	59
5.4	Age-specific vital statistics for free-roaming dogs presented to the Wellington SPCA shelter. . . . .	60
5.5	Age-specific vital statistics for free-roaming cats presented to the Wellington SPCA shelter. . . . .	60