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MOVEMENT PATTERNS AND PREY HABITS OF HOUSE CATS

*FELIS CATUS* (L.) IN CANBERRA, AUSTRALIA.

by

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House cat movements in Canberra suburbs adjacent to grassland and forest/woodland areas were examined using radio-telemetry over 9 months. Information on the composition of vertebrate prey caught by house cats in Canberra was also collected by recording prey items deposited at cat owners' residences over 12 months.

Home range areas of 10 suburban house cats, and a colony of seven farm cats, were examined using 95% convex polygons. Nocturnal home range areas of the suburban cats varied between 0.02 and 27.93 ha (mean 7.89 ha), and were larger than diurnal home range areas (range 0.02 to 17.19 ha – mean 2.73 ha). Nocturnal home range areas of cats from the farm cat colony varied between 1.38 and 4.46 ha (mean 2.54 ha), and were also larger than diurnal home range areas (range 0.77 to 3.70 ha – mean 1.70 ha). Activity levels were greater at night than during the day, though diel activity patterns varied seasonally in response to ambient temperature. Four suburban house cats moved between 390 m and 900 m into habitat adjoining the suburb. Movements further than 100–200 m from the suburb edge were always made at night. Polygons describing the home ranges of these animals were strongly spatially biased away from the suburban environment, though the cats spent the majority of their time within the bounds of the suburb.

In addition to nocturnal and diurnal effects, home range areas, and subsequently habitat utilisation, appeared primarily determined by the density and spatial distribution of cats utilising separate food resources, and the dominance of individual cats in local social hierarchies, rather than gender or neutering effects. Home ranges of cats in the farm cat colony overlapped extensively, as did those of cats living at the same suburban residence. There was little or no overlap between the home ranges of cats from different residences. Barriers, in the form of busy roads, appeared to also significantly influence home range size and shape.
Within home range areas, house cat movements during the day appeared strongly influenced by available cover (drains, tall grass, fences and shrubs etc.), and the location of resting/sunning spots and hunting sites close to home. At night, movement patterns appeared influenced by the location of favoured hunting sites toward the outer edges of home range areas (in this study, tall grass and scrub/forest habitat, and farm buildings).

Nineteen hundred and sixty one prey items representing 67 species were reported or collected. Sixty-four percent of the prey items were introduced mammals, with native birds comprising 14%, introduced birds 10%, unidentified birds 3%, reptiles 7%, amphibians 1% and native mammals 1%. Predation appeared to be largely opportunistic with respect to spatial and temporal (daily and seasonal) prey availability and accessibility. All amphibians and 62% of mammals taken by cats not confined at night, were caught at night. In contrast, 70% of birds caught, and 90% of reptiles, were taken during the day (45% of birds between 0600 h and 1200 h, and 61% of reptiles between 1200 h and 1800 h). There was some evidence that small mammals are preferred prey of house cats.

The mean number of prey items reported per cat over 12 months – 10.2 ± 2.66 (2SE, n=138) – was significantly lower than mean predation per cat per year – 23.3 ± 6.16 (2SE, n=138) – estimated by cat owners before the prey survey began. Seventy percent of cats were observed to catch less than 10 prey items over 12 months, but for 6% of cats, more than 50 prey items were recorded. Because counts of the amount of prey caught per house cat per unit time were highly positively skewed, data assumptions and statistical parameters used to extrapolate results from the study sample of cats, to the house cat population of Canberra, had a significant effect on estimates of total predation in Canberra. The precision of the total predation estimate was low (± 25%), from a sample of 0.3% of the Canberra house cat population. The accuracy of such estimates are dependent on how representative the study cat sample is of the wider house cat population, and on the proportion of prey items not observed by cat owners.
The total amount of prey taken was not significantly influenced by cat gender, age when desexed, or cat breed. Nor did belling or the number of meals provided per day have a significant influence on predatory efficiency. Cat age and the proportion of nights spent outside explained approximately 11% of the variation in the amount of prey caught by individual cats. House cat density and distance to prey source areas (rural/grassland habitat) explained 43% of variation in predation on introduced mammals and birds.

The impact of predation beyond suburb edges is likely to be most significant on populations of small to medium sized arboreal and ground-dwelling mammals, because of their nocturnal nature, and because they appear to be preferred prey types of house cats. Impacts on diurnally active prey, such as most birds and reptiles, are likely to be confined to within 200 m of residential housing (possibly further where good cover is available). Properly enforced nocturnal confinement should restrict the range sizes of cats that roam widely and utilisation of habitat beyond suburb edges, and also reduce predation on mammals and amphibians. Night-time curfews however, are unlikely to greatly reduce predation on diurnally active species, including most birds and reptiles. Curfews are currently neither widely adopted nor effectively practiced in Canberra.

Estimates of predation by house cats, particularly extrapolated estimates, should be treated with caution. They do not necessarily reflect relative impacts on different prey types. Nor do high rates of predation prove prey populations are detrimentally effected, particularly in urban environments. Nonetheless, on a small (backyard) scale in suburban environments, and in habitat within 1 km of residential housing, including isolated private properties, predation by individual cats may threaten populations of native wildlife. Hunting by house cats is particularly undesirable in relatively undisturbed habitat because of fundamental differences in the ecological processes operating in these areas (especially isolated remnants) compared with contrived and modified suburban environments. Adverse impacts on native fauna will always be potentially greatest in undisturbed habitat adjacent to new residential developments.
# TABLE OF CONTENTS

Declaration of originality i  
Copyright ii  
Acknowledgments iii  
Abstract iv  
Table of Contents vii  
List of Tables xi  
List of Figures xiv

## 1 General Introduction 1

1.1 Domestication of the Cat 1  
1.2 Predation by Feral Cats 2  
1.3 Predation by House and Farm Cats 5  
1.4 Territorial Behaviour and Home Range Sizes of Domestic Cats 7  
1.5 Study Rationale 9  
1.6 Study Aims and Significance 11

## 2 General Methods 12

2.1 Predation by House Cats 12  
  2.1.1 Description of Canberra Suburbs and Adjoining Environments 13  
  2.1.2 Methods used to Collect Cat Prey Data 15  
2.2 Home Range, Habitat Utilisation and Daily Activity Patterns 19  
  2.2.1 Recruitment of cats for monitoring 19  
  2.2.2 Description of Radio–telemetry Study Area 20  
  2.2.3 Radio–telemetry Methodology 22

## 3 Home Range Size and Habitat Utilisation 25

3.1 Introduction 25
3.2 Materials and Methods

3.3 Results

3.3.1 Home Range Size

3.3.2 Home Range Overlap

3.3.3 Habitat Utilisation – Suburban Cats

3.3.4 Habitat Utilisation – Farm Cat Colony

3.4 Discussion

4 Activity Patterns

4.1 Introduction

4.2 Materials and Methods

4.3 Results

4.3.1 Nocturnal and Diurnal Movement

4.3.2 Seasonal Differences in Nocturnal and Diurnal Activity

4.3.3 Seasonal Differences in Diel Activity Patterns

4.3.4 Activity and Ambient Temperature

4.4 Discussion

5 Prey Composition and Preference

5.1 Introduction

5.2 Materials and Methods

5.3 Results

5.3.1 Prey Species Composition

5.3.2 Bird Prey Preference

5.3.3 Seasonal Variation in Species, Gender and Age Composition of Prey

5.3.4 Spatial Variation in Prey Species Composition

5.3.5 Diel Predation Patterns

5.4 Discussion
6 Factors Affecting the Type and Amount of Prey Caught

6.1 Introduction 99
6.2 Materials and Methods 101
6.3 Results 102
   6.3.1 Cat Questionnaire Responses 102
   6.3.2 Effect of Cat Physical Attributes and Cat Management on the Type and Amount of Prey Caught 103
   6.3.3 Environmental Effects on the Type and Amount of Prey Caught 105
   6.3.4 Surplus Killing 108
6.4 Discussion 110

7 Extrapolating Predation Estimates 114

7.1 Introduction 114
7.2 Materials and Methods 115
7.3 Results 117
   7.3.1 Predation Rates per Cat and Total Predation per Annum in Canberra 117
   7.3.2 Predation Per Hectare in Outer Suburban Areas 117
   7.3.3 Estimated versus Observed Predation 117
7.4 Discussion 119

8 General Discussion and Conclusions 126

8.1 Impacts of Predation by House Cats 126
   8.1.1 Predation Impacts in Modified Environments 126
   8.1.2 Predation Impacts in Remnant Habitat 128
8.2 Impacts on Prey Populations in the Canberra Region 130
   8.2.1 Impacts on Birds 130
   8.2.2 Impacts on Mammals 133
LIST OF TABLES

Table 3.1 Gender, age and sexual status of radio-collared cats

Table 3.2 Nocturnal and diurnal home range areas and straight-line distances to furthest locations from 'home'.

Table 3.3 Habitat Utilisation by suburban cats. The total number of locations (n) and the proportion locations occurring in each habitat type are shown.

Table 3.4 Comparison of nocturnal and diurnal utilisation of the home/yard environment by suburban cats. The total number of nocturnal and diurnal locations (n) and the proportion of nocturnal and diurnal locations in the home/yard environment are shown.

Table 3.5 Comparison of nocturnal and diurnal utilisation of the rural/reserve environment by suburban cats. Analysis of utilisation of this environment type was only conducted with respect to those cats that spent a significant proportion of their time (more than six locations) in habitat beyond the suburb edge. The total number of nocturnal and diurnal locations (n) and the proportion of nocturnal and diurnal locations in the rural/reserve environment are shown.

Table 3.6 Habitat utilisation by farm cats. The total number of locations (n) and the proportion of locations occurring in each habitat type are shown.

Table 3.7 Comparison of nocturnal and diurnal utilisation of paddocks beyond the farm core area by farm cats. The total number of nocturnal and diurnal locations (n) and the proportion of nocturnal and diurnal locations beyond the farm core area are shown.
Table 3.8  Comparison of densities and home range sizes of house cats in different environments from this and previous studies.

Table 4.1  Mean distance moved (m) between consecutive observations (n=No. of cats).

Table 4.2  Mean percentage diurnal and nocturnal observations recorded as 'active' in spring, summer and autumn (n=No. of cats).

Table 5.1  Frequency and composition of prey items caught by 214 house cats in Canberra over the 12 month prey data collection period from May 1993 to May 1994.

Table 5.2  The relative abundance of the most common bird species recorded in the prey sample compared with the relative abundance of these same species in the gardens of suburban Canberra.

Table 5.3  Abundance of common bird prey of house cats (other than those shown in Figure 5.3) in suburban gardens in Canberra between 1984 and 1994.

Table 5.4  Gender ratios among rodents and birds recorded as prey items of house cats by season.

Table 5.5  Proportions of total rodent and bird prey items identified as juvenile or subadult by season.

Table 5.6  Frequency distribution over the 24 hr cycle of vertebrate prey items caught by free-ranging house cats (n=124).

Table 6.1  Mean and maximum number of prey items recorded per cat (n=138) over the 12 month prey data collection period from May 1993 to May 1994.
Table 6.2 Proportions of prey items consumed to different degrees by house cats.

Table 7.1 Total annual predation by house cats in Canberra estimated using the study sample median and mean number of prey items recorded per cat.

Table 7.2 Observed numbers of prey taken per cat and per hectare over 12 months by house cats in outer suburban areas (<200m from suburb edge) of Canberra.

Table 7.3 Estimated mean annual predation per cat by house cats in this and previous studies.

Table 8.1 The number of species recorded over one year as prey items of house cats in this study and approximate numbers of vertebrate species brushtail possum size or smaller occurring in suburban Canberra and adjoining rural land and CNP reserves.
LIST OF FIGURES

Figure 2.1 Map of Canberra showing the distribution of homes from which data on prey caught by cats was provided for at least one season of the study. Closed circles indicate homes where prey items were collected by the author. Open circles indicate homes where catches were recorded on data sheets by the cat owner.

Figure 2.2 Map of the radio telemetry study area. The location of residential properties where radio-collared cats lived are shown in red, and the 'core' area of the farm inhabited by the farm cat colony (see text) is also indicated.

Figure 3.1 Nocturnal home ranges of farm and suburban house cats, estimated using 95% minimum convex polygons.

Figure 3.2 Diurnal home ranges of farm and suburban house cats, estimated using 95% minimum convex polygons.

Figure 4.1 Diel activity patterns of suburban and farm cats in spring, summer and autumn. Lines have been smoothed by plotting the average of consecutive observations.

Figure 4.2 Activity patterns over the 24 hr cycle for suburban cats and farm cats using combined spring summer and autumn data. Lines have been smoothed by plotting the average of consecutive observations.

Figure 4.3 Active observations between midday and 1800 h, shown as a percentage of all observations taken during this period, plotted against maximum daily temperature.

Figure 4.4 Active observations between midnight and 0600 h, shown as a percentage of all observations taken during this period, plotted against minimum daily temperature.
Figure 5.1 Map of Canberra showing 1993/94 Canberra Ornithologist Group Garden Bird Survey sites.

Figure 5.2 Total and average number of prey items recorded per month.

Figure 5.3 Temporal trends in abundance of preferred bird prey species of house cats (house sparrows and blackbirds), and the two most commonly taken native bird species (silveryeyes and crimson rosellas).

Figure 5.4 Average number of mammal, bird, reptile and amphibian prey items recorded per cat per month.

Figure 5.5 Seasonal variation in the mean amount of prey caught per cat (± 2SE) by taxonomic prey classes.

Figure 5.6 Proportion of native to introduced bird prey items recorded each month.

Figure 5.7 Proportion of native to introduced bird prey items recorded each season.

Figure 5.8 Relative frequency of birds and reptiles and introduced mammals in the prey sample with respect to distance from rural/grassland habitat adjoining suburban areas.

Figure 5.9 Relative frequency of birds and reptiles and introduced mammals in the prey sample with respect to distance from woodland/forest habitat adjoining suburban areas.

Figure 5.10 Relative frequency of birds, reptiles and introduced mammals in the prey sample with respect to suburb age.
Figure 6.1 Relationship between the number of introduced prey items recorded per cat and distance from rural/grassland habitat adjoining suburban areas.

Figure 6.2 Relationship between the number of native prey items recorded per cat and distance from non-suburban habitat.

Figure 6.3 Relationship between mean proportion of individual prey items consumed and total number of prey items caught per cat.

Figure 7.1 Frequency histograms of estimated and observed number of prey items caught by cats over one year.

Figure 7.2 Relationship between estimated and observed amount of prey caught by house cats per year. The expected model for the data, where predicted estimates exactly match observed estimates, is shown by the dashed line. The fitted regression model is shown by the bold line.