

# CHANGES IN AUSTRALIA'S DOMESTIC CAT POPULATION SINCE 1979 WITH FORECASTS TO 2005

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This paper reports the findings of telephone surveys used to estimate Australia's domestic cat population each year since 1979 as well as forecasts made for the period 1999 to 2005 using a simple life table model. By combining a modeling approach with information obtained in surveys, it was hoped that the major factors resulting in population changes could be identified.

## Materials and Methods

Estimates of the population of domestic cats owned by Australian households were made by two methods. From 1979 to 1999 annual estimates of the cat population were obtained by telephone surveys while a simple life table model was used to forecast the population from 1996 to 2005. A comparison of population estimates from the model with those from surveys undertaken from 1996 to 1999 provided a check on the model's validity.

For the surveys, the sample frame comprised those households with a listed telephone number which is approximately 90% of all Australia households. The sample size and selection methods were designed to provide reliable estimates for national, state and regional populations of household pet-owning characteristics. From 1979 to 1997, an annual total of 12,000 interviews was undertaken. In 1998, the number of interviews was reduced to 6,000 and in 1999, the number was 9,000. Interviews were undertaken throughout each year over a mid-month, ten-day period, Saturday to Wednesday providing 12 independent samples throughout each year for each region. Contact procedures were designed to ensure that each selected household was given a similar opportunity to respond. Monthly data were combined to provide annual estimates for Australia's domestic cat population.

A simple mathematical model using a life table method<sup>1</sup> was developed in late 1995 based on findings from the 1994 and 1995 surveys. The annual household cat population was then forecast for the years 1996 to 2005. The annual uptake rate of young cats into households was assumed to be constant from year to year. The value used for this rate was 10.5% calculated as the number of cats less than one year old in 1995 (312,000) divided by the total population of cats in 1994 (2.968 million) estimated from the surveys. The number of cats less than one year old taken up by households in each subsequent year was calculated by multiplying the constant annual uptake rate by the total number of cats in the population in the preceding year. The probability of cats surviving from one year to the next was estimated for each yearly age group from the population age structure measured in the 1995

survey. For simplicity in the model, it was assumed that the uptake into households of cats one year or older and the number of cats surviving more than 20 years were negligible.

Calculations were made in a Microsoft Excel (Microsoft, Redmont, WA) spreadsheet. Simulations within the spreadsheet were performed with @Risk (Palisade, Newfield, NY) using 1000 iterations of a Pert distribution at 5% to generate a band of uncertainty for future populations providing a mean, maximum and minimum annual population forecast.

## Results

The Australian household cat population climbed steadily from 2.23 million in 1979 to reach a peak of 3.24 million in 1988. Since that time, the population has decreased steadily to 2.6 million in 1999. The model predicts that, if the present uptake rate of cats into households and loss rates remain relatively constant, the total household cat population will decline to 2.5 million by the year 2000 and to 2.2 million by 2005 (Figure 1).

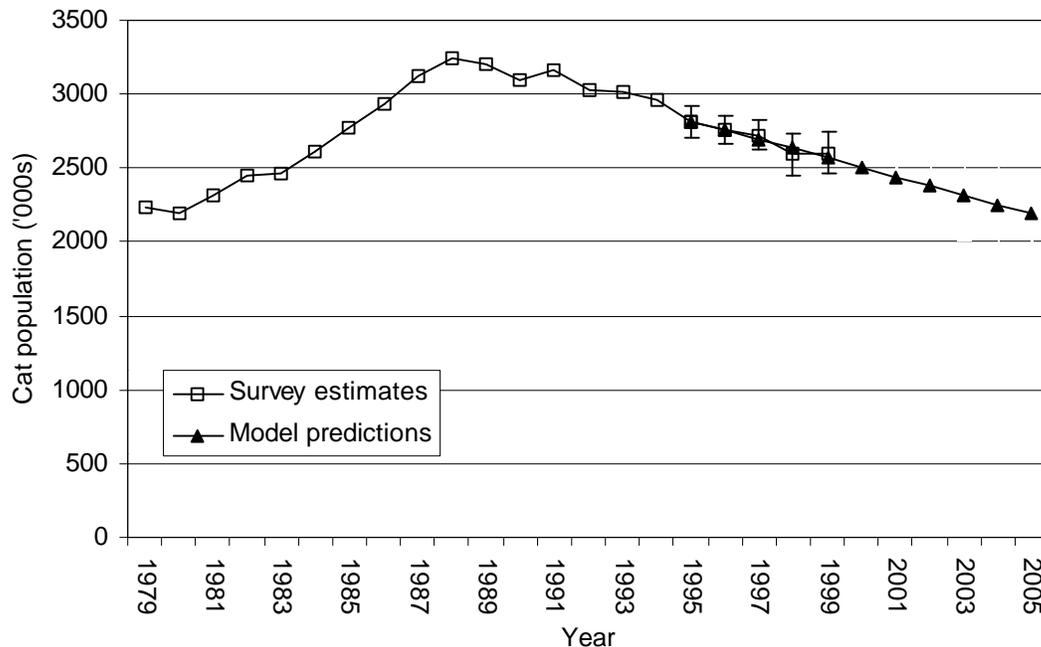


Figure 1. Estimates of Australia's domestic cat population from 1979 to 2005. Values for 1979 to 1999 are based on telephone surveys with 95% confidence limits shown for 1994 to 1999. Values for 1996 to 2005 are forecasts from a life table model with average, minimum and maximum values obtained from a 5% pert distribution for 2000 to 2005.

Annual populations forecast by the model are slightly different from the subsequent survey estimates for the four years for which estimates were obtained using both methods (0.1% lower in 1996, 1.1% lower in 1997, 1.5% higher in 1998 and 1.3% lower in 1999). However, in each of the four years, the predicted value is well within the sampling error of the surveys. This suggests that the approach used in the model has captured the major determinants of the overall household cat population.

## Discussion

The telephone surveys described here are the first published account of changes over time in Australia's household cat population. The surveys provide strong evidence that the population is declining. This finding is supported by the life table modeling which attempts to explain changes in the population in terms of maintenance of the age structure and uptake rate of young cats into households.

The ongoing decline represents a compounding annual decrease of more than 1.5% in the overall population of Australian household cats. This compares with a compounding annual increase of between 1.0%<sup>2</sup> and 1.7%<sup>3</sup> from 1990 to 2000 forecast for US domestic cats. If the trend continues as currently forecast, the Australian cat population in 2005 will have declined by 32% from its peak in 1988.

The average number of cats per cat-owning household in Australia has remained relatively static at approximately 1.47. However, the percentage of households owning a cat appears to be declining. In 1994 it was 31.1%, while in 1999 it was 25.8%<sup>4</sup>. By way of contrast, in the USA, the number of cats per cat owning household has increased from approximately 1.96 in 1986 to 2.1 in 1996 while the estimated proportion of households owning cats in 1996 was 27.5%.

For the purposes of the model the uptake rate was taken to be 10.5% which gave valid model forecasts when compared to survey estimates for 1996 to 1999. This uptake rate results in a declining population when combined with current loss rates. To maintain the 1995 population level through to 2005, the model suggests that the annual uptake rate would need to be approximately 13% assuming the age structure remained relatively constant.

It is concluded that the declining cat population in Australia is due to a decreasing number of cats being taken into households each year with a resultant decline in the proportion of cat-owning households.

## References

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