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Diet of Free-Roaming Cats Across a Gradient of Urbanization in Southern California (Abstract)

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ABSTRACT: Free-roaming cats (*Felis catus*) are considered one of the most damaging invasive vertebrate pests in natural areas globally and are a major source of mortality for small animals in suburban and urban environments. Domestic cats are also considered to be a nuisance and a source of disease transmission to pet cats and to wildlife. Historically, the most common method of managing free-roaming cats has been euthanasia, but non-lethal approaches, such as trap-neuter-return (TNR), are increasing in popularity with the public. TNR-sterilized cats, subsidized by regular human feeding, remain in the environment and continue to prey upon wildlife and to be a source of disease and nuisance. However, the extent to which these cats depend on wild-caught prey vs. provisioned pet food is not clear. Moreover, if TNR colonies are located in areas of intensive human development, predation by these cats may be focused on commensal or widespread prey species rather than native species of conservation concern. Management of free-roaming cats aimed at protecting wildlife at the urban-wildland interface requires knowledge of the diet of cats across a gradient of land-use, from rural and natural open space to intensively developed suburban and urban areas.

Our aim is to use stable isotope analysis to determine the diet of free-roaming cats in southern California, using ear tissue collected during TNR sterilization procedures. We will compare stable carbon and nitrogen isotope values of free-roaming cats, collected across a gradient of anthropogenic land use, to isotope values of potential prey and anthropogenic foods to determine whether they consume native or commensal prey, or rely on human-provisioned food.

To date we have collected more than 300 cat ear tissue samples from veterinary clinics that perform spay and neuter procedures to support TNR programs in the greater Los Angeles metropolitan area. We have also coordinated with vector control agencies and wildlife rehabilitators in the region to collect samples of local commensal and non-commensal bird species, as well as collected samples of commercial pet food. Samples will be dried and homogenized and sent to UC Davis Stable Isotope Facility for analysis using mass spectrometry. When results are received, we will use stable isotope mixing models to estimate the contributions of different food types to cat diets. Additionally, we will plot the capture locations of each cat in a geographic information system (GIS) and characterize the landscape surrounding each cat using data layers depicting the type and amount of land use and degree of urbanization. We predict that free-roaming cats living in more urbanized areas will consume primarily pet food and commensal vertebrates such as rats and mice, pigeons, and house sparrows, whereas those living in less urbanized areas and closer to natural open spaces will consume more wild and native prey species. Preliminary data analyzed to date suggest that many trapped cats rely on anthropogenic foods, including pet food, rather than consuming wild-caught prey, and that consumption of these food resources increases with the degree of urbanization around cat capture locations. We hope that our results can help inform management decisions about how and where to permit the implementation of TNR, especially in areas likely to support native species of conservation concern.

KEY WORDS: anthropogenic foods, commensal prey, diet, domestic cat, *Felis catus*, stable isotope analysis, TNR, trap-neuter-return, urbanization

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