

## Effect of domestic cats on the behavior of common birds in the peri-urban area of the city of Granada

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### INTRODUCTION & AIM

Invasive alien species such as the domestic cats (*Felis silvestris catus*) have coexisted with humans, initially as commensals, since their domestication more than 9,000 years ago in the Near East, but now, mostly as pets. The increasing feral populations has had negative effects on biodiversity, having an important role in the threat or extinction of approximately 430 animal species (Doherty *et al.*, 2016; Marra & Santella, 2016; Lepczyk *et al.*, 2023). Furthermore, this species is one of the main birds' predators in urban areas, and birds are the most frequent taxonomic group in the diet of cats on all continents and the one with the greatest number of species belonging to the categories "Near Threatened", "Threatened", or "Extinct" (Lepczyk *et al.* 2023). In the last two decades, cats are being attracted by the provision of supplemental food by citizens in urban areas, grouping in colonies. These feeding points not only promote the proliferation of cats in urban and peri-urban areas, but also favor the increase in their populations by improving their survival and reproduction.

The presence of a feline colony in the monumental complex of the Alhambra (Granada, Spain) and surrounding areas have shown to have a negative effect in reptiles and could also have a negative effect in other wildlife. In this work we assess the effects of the presence and abundance of feral cats in the abundance and richness of common birds in peri-urban areas.

### METHOD

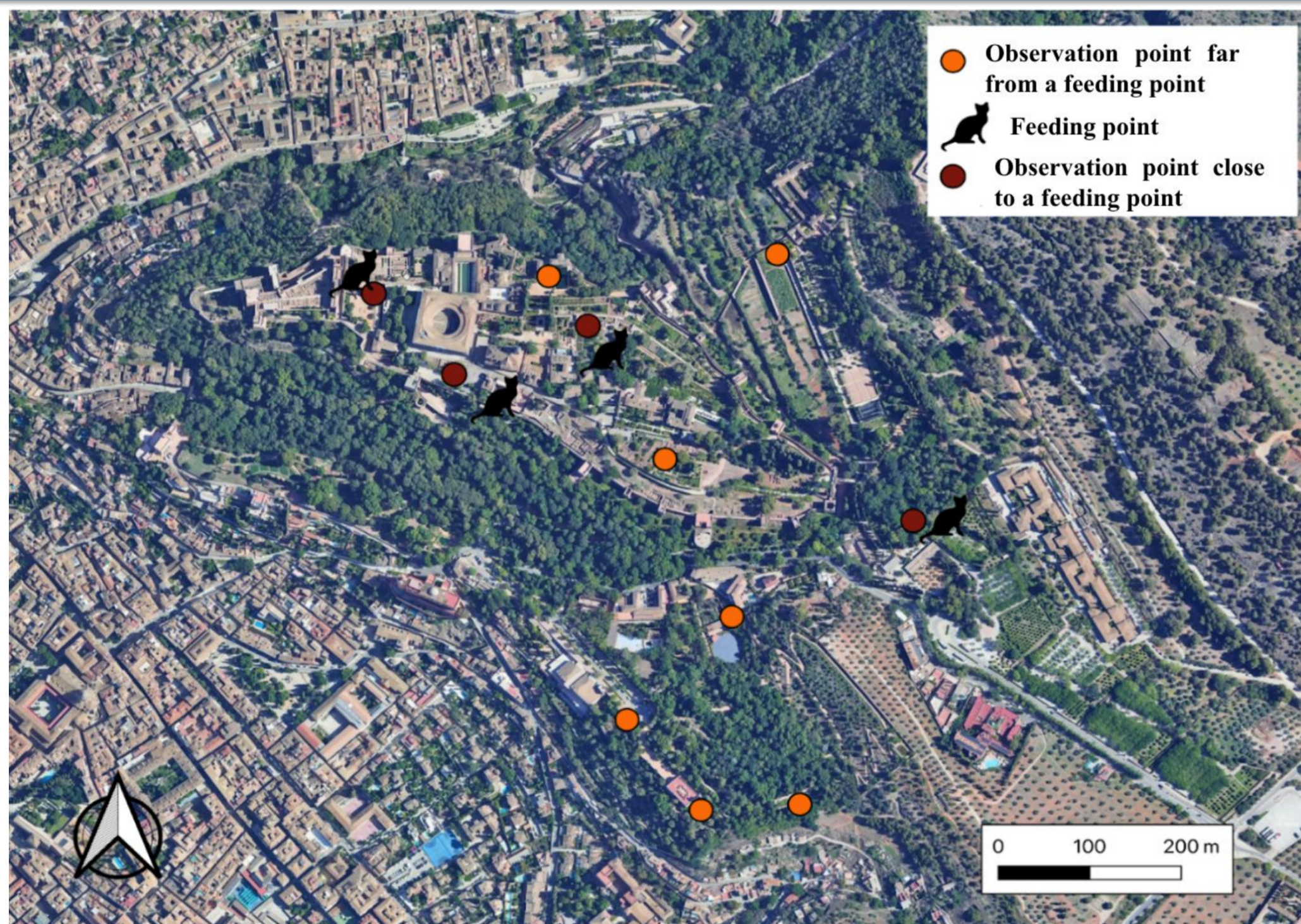
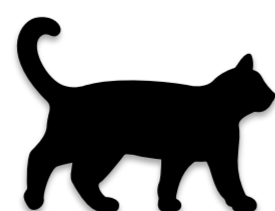
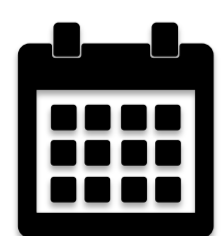


Fig. 1. Aerial view of the study area. The orange dots correspond to observation points far (>50 m) from an official feeding point. Red dots correspond to observation points close (≤50 m) to an official feeding point. The cat figure corresponds to the location of the feeding points.

Data collection (15<sup>th</sup> December 2023 - 30<sup>th</sup> April 2024) took place weekly, with an increase in sampling effort at the end of the study. From fixed observation points, whether seen or heard, the species and number of individual birds were recorded during 5 minutes.



were also recorded



Individuals of species that spend most of their time in flight were not taken into account in the statistical analyses. House sparrow was also not taken into account in birds abundance as it was correlated with human presence, very high in some observation points close to cat feeding points.

### RESULTS & DISCUSSION

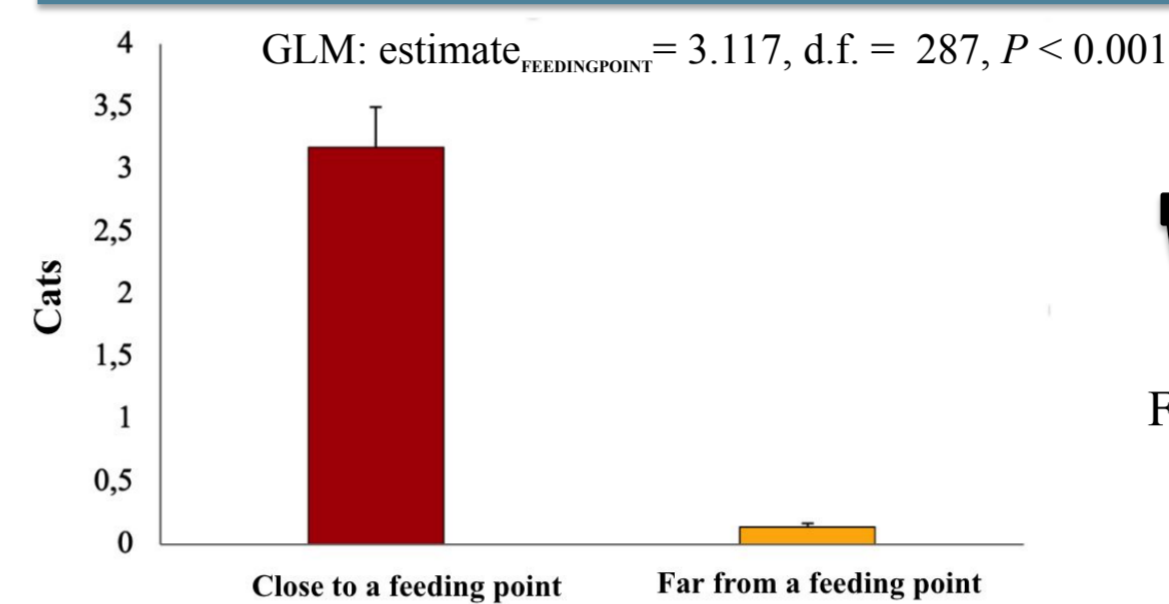
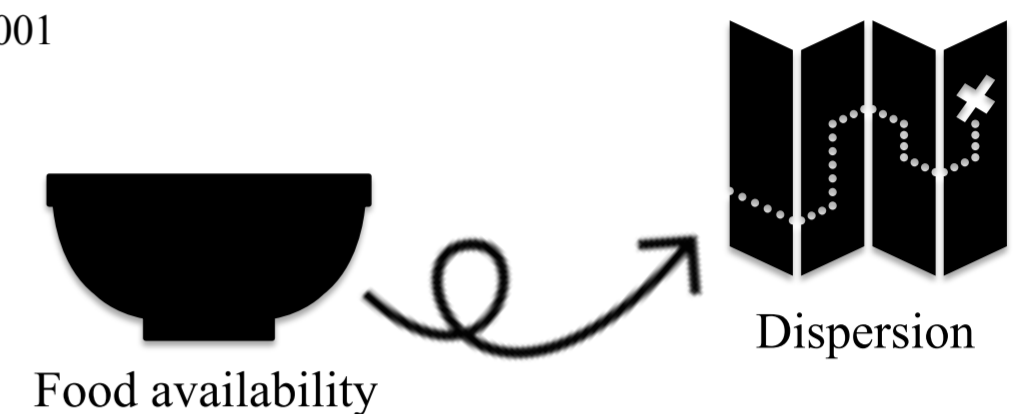


Fig. 2. Average number of cats counted ± standard error (SE) at observation points close to (n=103) and far from (n=185) a feeding point.



The abundance of cats had a concomitant effect with the number of people.  $\tau = 0.417, P < 0.001$

Table 1. GLM carried out for bird abundance.

Bird abundance	Parameter	Estimate ± SE	P value	d.f
	Intercept	3.148 ± 0.120	< 0.001	287
	Feeding point	0.436 ± 0.119	< 0.001	287
	Number of cats	0.17 ± 0.143	0.238	287
	Number of people	-0.016 ± 0.002	< 0.001	287
	Hour (late in the morning)	-0.706 ± 0.097	< 0.001	287
	Date (julian)	0.003 ± 0.001	< 0.001	287
	Number of cats * feeding point	-0.125 ± 0.026	< 0.001	287

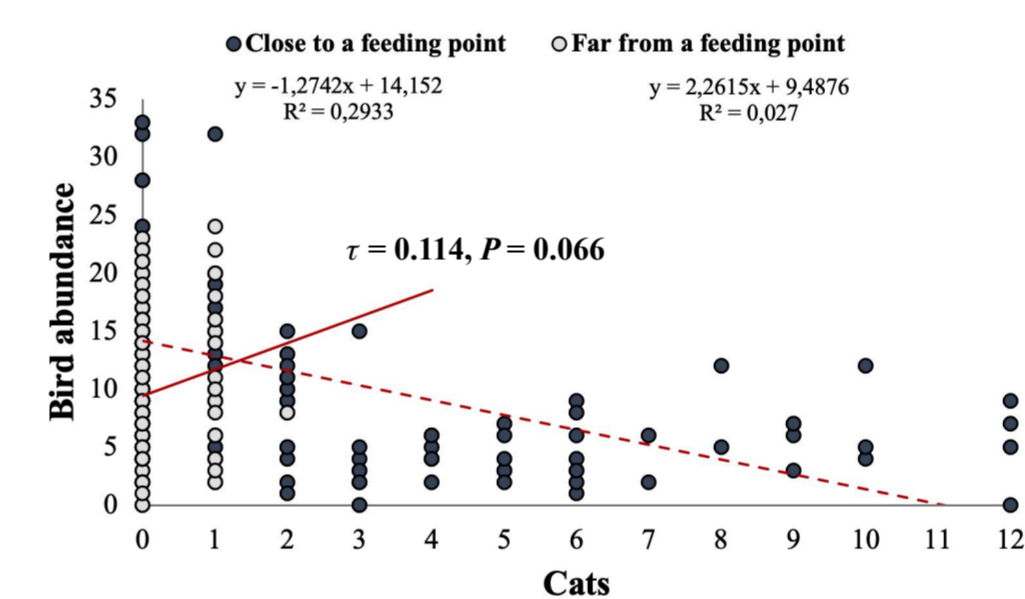


Fig. 3. Bird abundance vs cats close to feeding points (n = 103 visits to feeding points, range of cats: 0-12) and far from feeding points (n = 185 visits to points where cats were not fed, range of cats: 0-2).

Table 2. GLM carried out for bird richness.

Bird richness	Parameter	Estimate ± SE	P value	d.f
	Intercept	1.593 ± 0.067	< 0.001	287
	Feeding point	0.173 ± 0.063	< 0.001	287
	Number of cats	0.108 ± 0.076	0.157	287
	Number of people	-0.005 ± 0.001	< 0.001	287
	Hour (late in the morning)	-0.149 ± 0.052	< 0.001	287
	Date (julian)	0.002 ± 0.001	< 0.001	287
	Number of cats * feeding point	-0.048 ± 0.017	< 0.001	287

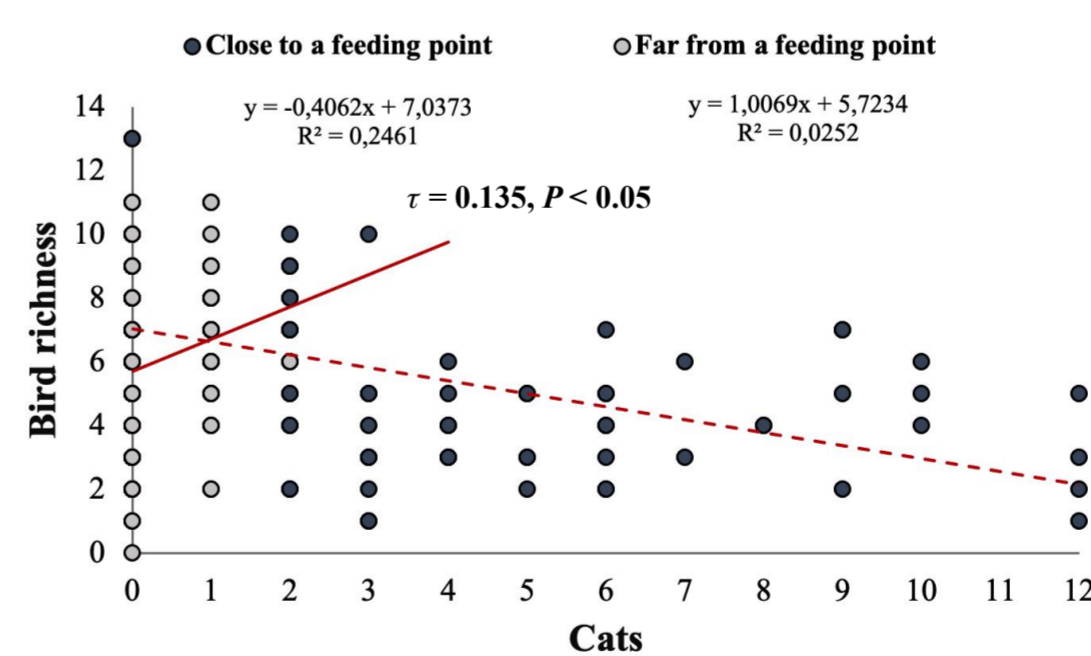
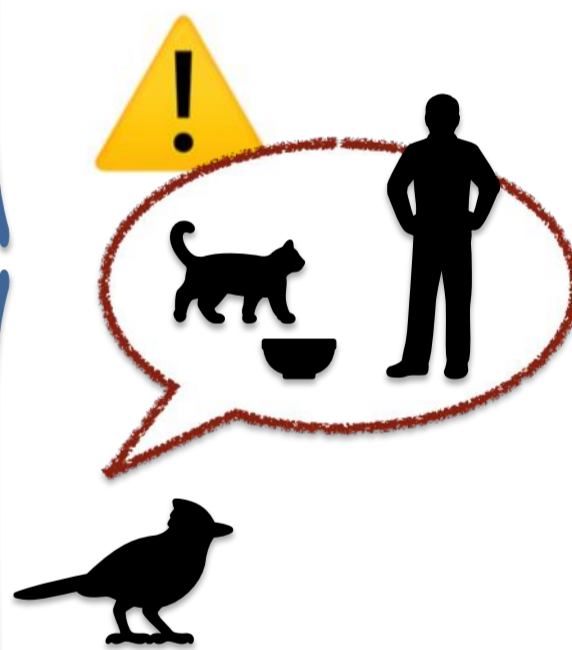


Fig. 4. Bird richness vs cats close to feeding points (n = 103 visits to feeding points, range of cats: 0-12) and far from feeding points (n = 185 visits to points where cats were not fed, range of cats: 0-2).



Choosing alternative areas due to the threat posed by human and feline presence, both perceived as a risk of predation.

### CONCLUSION

This work highlights the effect of feeding points and the abundance and presence of cats, as well as people on the bird abundance and richness. A possible management measure would be to feed the cats that make up the feline colony of the monumental complex at a single (or 2) trophic supplementation point, reducing the impact that both cats and tourist overcrowding have on them.

### REFERENCES

- Doherty, T. S., Glen, A. S., Nimmo, D. G., Ritchie, E. G., & Dickman, C. R. (2016). Invasive predators and global biodiversity loss. *Proceedings of the National Academy of Sciences of the United States of America*, 113 (40), 11261–11265.
- Lepczyk, C. A., Fantle-Lepczyk, J. E., Dunham, K. D., Bonnaud, E., Lindner, J., Doherty, T. S., & Woinarski, J. C. Z. (2023). A global synthesis and assessment of free-ranging domestic cat diet. *Nature Communications*, 14 (1).
- Marra, P. P., & Santella, C. (2016). *Cat Wars: The Devastating Consequences of a Cuddly Killer*. Princeton, NJ: Princeton University Press.