

HABITAT SELECTION BY FREE-ROAMING DOMESTIC DOGS IN RABIES ENDEMIC COUNTRIES

Laura Cunha Silva¹, Brian Friker¹, Charlotte Warembourg¹, Kaushi Kanankege², Ewaldus Wera³, Monica Berger-González^{4,5}, Danilo Alvarez⁴, Salome Dürr¹



INTRODUCTION

Domestic dog bites are the source for 99% of human rabies cases worldwide, and these occur in resource-poor countries where dogs are predominantly kept free-roaming. Understanding how dogs roam and their preferred locations to inhabit can inform us about possible high-risk locations for rabies transmission, and allow targeting these resources as ideal locations for oral rabies vaccination (ORV) campaigns of inaccessible dogs.

STUDY OBJECTIVES

Identify FRDD preferred resources in rural and urban landscapes

Investigate habitat selection by Free-Roaming Domestic Dogs (FRDD) based on collected GPS data

Inform the planning of oral rabies vaccination campaigns for FRDD

MATERIALS & METHODS



In all sites, dog were collared with a geo-referenced contact sensor (GCS) to record their position every minute over a period of 5 days

n = 321 FRDD



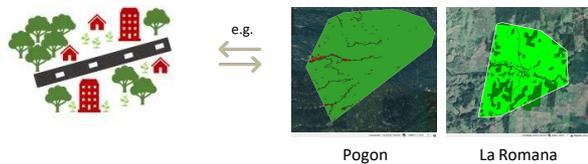
STEP 1

STEP 3

STEP 2

STEP 4

- The available habitat was determined using the Minimum Convex Polygon approach (MCP);
- Within the MCP, relevant habitat resources were manually identified;
- In all study sites, buildings (in red), roads (in black) and high vegetation (dark green), low vegetation (light green) or both were present.



Spatial mixed-effect logistic regression model



- Y = Presence / Absence of a dog GPS fix
 - Fixed effects = Habitat resources + Hour² + Slope²
 - Random Effect = Dog's household location
- ¹ Hour variable was introduced to account for the non-equal recording of GPS fixes over the observation period
²In Habi slope not investigated because of flat terrain

The resource "roads" was used as the reference level.

RESULTS

- In Habi, La Romana and Sabaneta FRDD most preferred resource was buildings whilst in Pogon and Poptún it was roads;
- In Habi, significant reduced presence of FRDD was recorded in low vegetation, open fields and sea when compared to roads;
- In Pogon, FRDD are significantly more likely to be present in roads than in high vegetation (OR = 0.08);
- In Poptún, roads are significantly preferred over low vegetation (OR = 0.26);
- In La Romana, significantly fewer dogs are present in high and low vegetation than roads (OR = 0.02; OR = 0.12, respectively);
- In Sabaneta, roads are significantly preferred over low vegetation (OR = 0.06);
- Steep slopes were associated with the absence of FRDD.

MAIN TAKEAWAYS

The results disclosed a similar pattern of habitat selection by FRDD, independent of country and landscape;
 The most preferred locations were buildings and roads;
 FRDD were significantly less often present in vegetation compared to buildings and roads;
 FRDD clearly avoid steep terrains, favouring flatter topography.

CONCLUSION

By pinpointing resources where dogs are most probably in, our study can enable efficient allocation of ORV baits to otherwise inaccessible high-risk subpopulations of dogs, contributing to the achievement of Zero by 30