Study of the urban and periurban wild boar (*Sus scrofa*) population (2017-2018) in La Floresta (Sant Cugat del Vallès, Spain) by tracing and animal sightings

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INTRODUCTION AND OBJECTIVES

The constant increase of urban wild boar populations is becoming a social and public health concern. Specifically, the city of Sant Cugat faces the challenge of urban wild boar overpopulation.

The main objective of this study is advancing in the understanding of the detection of wild boar in urban and periurban environments. This objective is further composed by three specific goals: studying the effect of landscape on wild boar sightings and presence indicators in the urban and periurban area of La Floresta; finding out the correlation between traces and wild boar presence in the urban and periurban area of La Floresta; and predict the wild boar density in La Floresta in the academic year 2017-2018.

MATERIALS AND METHODS

Four transects, namely A, B (split up in B1 and B2), C and D were surveyed three times a month from July 2017 to May 2018, in order to detect wild boar presence indicators and/or wild boar.

The data collected were traces (foot print, rooting, faeces, tree marks, resting zones and passing zones), type of landscape (amount of acorn, slope valley and vegetation density), presence of anthropogenic food, natural food and water and climatology. As well as presence and abundance of wild boar.

Data from 101 transects with up to 56 variables registered for each one were statistically analysed using Microsoft Excel 2010, R-Studio (statistical program) 3.5.0 and Q-Gis (geographic system) 3.0.3.

RESULTS

Traces and sightingso ver the year:

The higher mean rooting surface was in the months comprehended between October and January with a pick in December. Mean faeces appeared from July to September. Passing zones and tree marks kept constant over the year.

Wild boar activity was high in August and decreased over autumn and winter (except in December, which had a peak) and increased again in spring (Figure 1).
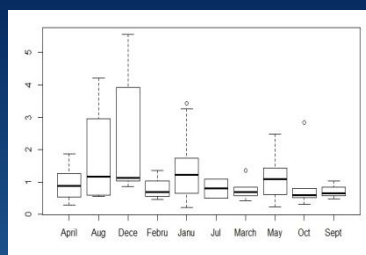
Variable interactions:

The trace that better predicts the presence of wild boar is rooting surface.

The variable that better predicts the number of wild boars was the root surface (m^2). Wild boar were more abundant when resting surface (RZ_m2) and rooting surface (R_m2_t) were above 19 m^2 and 12 m^2 respectively (Figure 2).

The amount of acorn and vegetation density was equally important to report wild boars sightings.

Landscape was more important to the activity index than food or water. The most important variable influenced by vegetation cleaning was passing zones. Resting surface and rooting surface were the second and the third more important variables influenced.
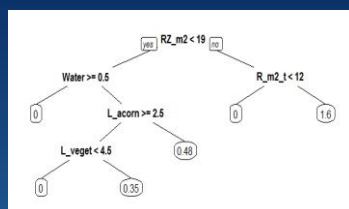
Wild boar density:

34 total wild boars (11 adult) were reported in 8 different groups. The minimum polygon method (Figure 3.) predict an adult wild boar density of 8.20 wild boar group / km^2 and 11.27 adult wild boars / km^2 respectively.

Wild boar abundance prediction by tracing:

6.40 mean square metres of rooting in 100 metres transect correspond to 1 adult wild boar.

Figure 1 . Index activity variability per month.

Figure 2. Regression tree of wild boar abundance.

Figure 3. Wild boar groups represented in a map.

DISCUSSION

Wild boar traces are most likely detected in summer; in areas with anthropogenic food; and a great slope valley landscape with presence of acorn and high vegetation density. Since anthropogenic food tends to be highly caloric and easy to get, wild boar presence is positively correlated with the location of food resources. Besides, wild boars feeding next to containers are easier to be detected. Acorn and high vegetation density provide food and refugee for wild boars, explaining the correlation between this landscape and wild boar presence. Nevertheless, it is negatively correlated with wild boar abundance, because piglets could easily go unnoticed in the dense vegetation, decreasing the number of wild boar detected in each encounter. The seasonal trend of each type of trace was diverse due to trace durability. Passing zones and tree marks were quite constant throughout the year.   Even though a landscape with acorn and high vegetation density is the environment with more wild boar encounters, foot print is negatively correlated with this habitat, probably because traces are more difficult to be detected in a ground covered with dense vegetation. However, resting zones and passing zones are positively correlated to this type of landscape because they are more evident in a great vegetation density. Rooting surface is the variable of choice to study the effect of vegetation cleanings on wild boar activity and presence, since its detectability is less affected by the vegetation cleanings. Wild boar activity index was high in summer. December peak was due a heavy increase of rooting surface only in transect D. Moreover, wild boar density in La Floresta in the period 2017-2018 (11.27 wild boars / Km^2) was slightly higher than in 2015-2016.

CONCLUSION

This study defined the best environment features in La Floresta to detect wild boars: a great slope valley with high amount of acorn and vegetation density near to anthropogenic food. Vegetation cleaning influences negatively wild boar presence, and could therefore be an effective urban wild boar overpopulation control. However, further specific studies on the effects of vegetation cleanings on urban wild boar presence and abundance need to be performed.

Wild boar detection, in order to predict the wild boar density, could be difficult, especially when wild boars are non-habituated to human. This study demonstrates that rooting is the better wild boar abundance predictor. La Floresta has a high wild boar density compared to the rest of Catalonia , which had even slightly increased in the last two years. Anthropogenic food control and vegetation cleaning must be primordial to control the urban wild boar population in La Foresta.