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RED FOX SIGHTINGS IN ROME

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ABSTRACT - In this study preliminary data on the presence of Red fox in Rome (an area of 360 km^2 within the Rome ringroad. G.R.A.) since 1980 are presented. The data were mapped on a UTM 1 sq. krn. grid. Data were analysed and correlated, for each City district, with the prevalent environment (green, built-up, river-side areas) and with the density of inhabitans.

Key words: Red fox, *Vulpes vulpes*, Distribution, Urban habitat, Rome.

INTRODUCTION

The urban habitat of Rome is characterized by a particularly dynamic environment and a highly fragmented distribution of resources (cfr. Dickman arid Doncaster, 1987). Within the "Grande Raccordo Anulare" (G.R.A., the Rome ringroad) "biological corridors" can be identified, which link the green extra-urban areas with the more inner city districts as well as natural or semi-natural areas which are completely surrounded by built-up areas.

Of particular interest. in this context. is the presence of the Red fox *Vulpes vulpes*, a predator at the top of the food chain which is of notable behavioural adaptability. In fact it can adapt rapidly to environmental changes which enables it to exploit new food sources successfully, as. for example, urban waste in the city (Harris, 1986: Macdonald. 1987: Doncaster et ai. . 1990).

MATERIAL AND METHODS

This research. promoted by the Municipality of Rome (Department of Animal Rights) and the University of Rome "La Sapienza" (Department of Animal and Human Biology). contains some preliminary data on the presence of the Fox in the Rome area within the G.R.A. (360 km^2).The data date back to 1980, and was supplied by several researchers who worked in the urban area using their own personal observations; subsequently. the first direct surveys were carried out (1994). All the data. past and present. has. therefore, been mapped (Fig. 1) using an U.T.M. grid (1x1 km^2 basis). For every specimen. the following parameters were considered and analysed: the prevalent environment and its density of inhabitants. The environment was classified into three categories: green, built-up and river-side areas. The respective areas were analysed by subdividing each quadrant into smaller sections. 0.5 x 0.5 sq km basis) and assigning to each of these its prevalent environmental typology (cfr. **AA.** VV., 1991).

RESULTS AND CONCLUSIONS

The resulting data were split up "Circoscrizioni" (City districts), taking into consideration for each one only the area falling within the G.K.A. (Fig. 1). For each City district. the number of quadrants, in which the presence of the Fox was noted, was related to the total area of each City district (Table 1). The density of quadrants. in which the presence of the Fox was registered. was, finally, correlated, using the Spearman rank correlation technique (Siegel and Castellan. 1992), whereby the percentages of the environmental typologies under consideration were compared to the density of inhabitants (Table 2).

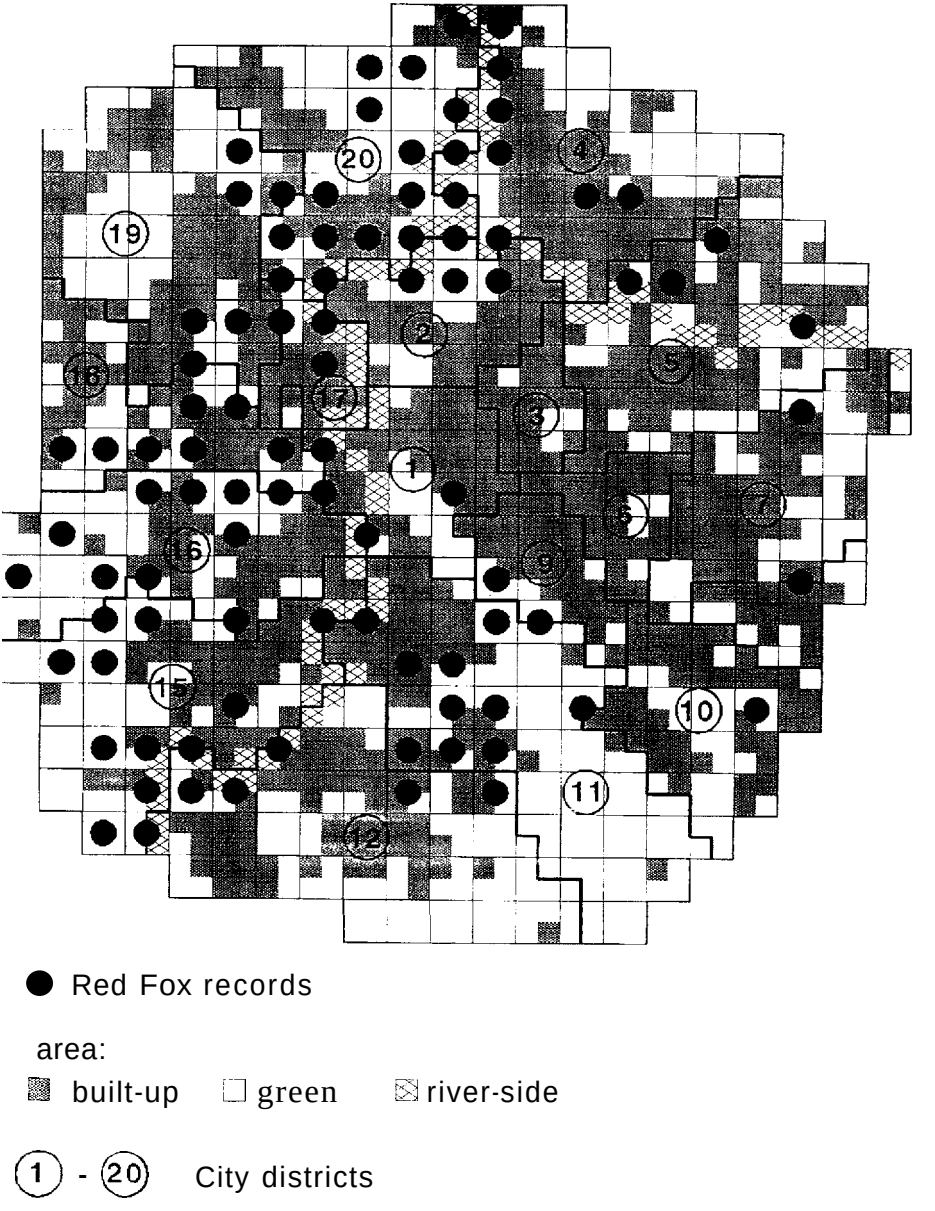

Figure 1 - Red Fox sightings in Rome (1980-1995)

From the data (Table 1) it emerges that the greatest number of quadrants in which the presence of the Fox was registered. generally falls in City districts with a higher percentage of green areas (11, 15, 16, 18, 20). The data referring to City district n° 17. where the percentage of green areas is very low. is probably determined by both the presence of green and river-side areas along its limits and by the fact the area is in a very central position, so as a result here the most frequent observations were made. The re-

Table 1 - Habitat characteristics and fox's presence of urban districts. CD: City district; A: area in km^2; D: population density (number of people km^{-2}); G: percentage of green areas. including natural parks, waste lands and woodlands: B: percentage of built-up areas; R: percentage of river-side habitat; S percentage of 1 km squares with fox's presence.

CD	A	D	G	B	R	S
1	14,50	9320	0,24	0,66	0,10	0,28
2	13,50	9870	0,33	0.50	0.07	0.22
3	6,00	10760	0,17	0,83	0,00	0.00
4	30.00	2200	0,38	0,50	0,12	0,27
5	30.00	3600	0.33	0.57	0.10	0,13
6	8.00	18710	0.13	0,88	0,00	0.00
7	19,00	1070	0,39	0.61	0.00	0.05
8	5.50	1630	0.36	0.61	0,00	0.18
9	8.50	18800	0.24	0.70	0,00	0.12
10	17,00	1830	0.41	0,59	0.00	0.06
11	35.50	3110	0.65	0,34	0.01	0.31
12	35.00	770	0.56	0.40	0,04	0.14
15	30.50	2290	0,54	0.33	0,13	0.39
16	25.00	2190	0,62	0,36	0,02	0.40
17	6,00	14940	0.17	0.67	0.17	0.67
18	16,50	2000	0,48	0,52	0.00	0,42
19	31.50	1370	0.49	0,51	0.00	0.19
20	28,00	750	0,59	0,32	0.09	0,54

sults of the correlations confirm a positive link between the presence of the Fox and the percentages of green and river-side areas (Table 2). The density of inhabitants and the percentage of buildings are, however, negatively correlated (Table 2).

The first results, presented here, indicate a consistent presence of the Fox within the considered area, with a prevalent distribution in the green areas and particularly along the "biological corridors" that penetrate the urban structure (the river-sides of the Tiber and the Aniene, the green areas of Appia Antica, Pisana. Insugherata, Acquatraversa, Inviolatella, etc.). In fact, the presence of such corridors in Rome, which are fundamentally important for the urban ecosystem, and which infiltrate into the city from the surrounding areas, provides the Fox with access both to areas with higher availability of trophic resources, as well as a greater success in the phase of dispersion of subadults.

Table 2 - Spearman rank correlation r_s (n=18) between fox's presence and habitat characteristics. D. G. B, R. C, S as in tab. 1.

	r_s	P	corr
D - S	- 0.400	> 0.05	
G S	0,450	> 0,05	+
B - S	-0,556	> 0.05	
R - S	0.619	> 0.05	+
C - S	-0,364	> 0.05	

The capacity of dispersion is an essential characteristic for territorial animals like the Red fox. particularly in an environment where food resources are distributed randomly and where the local density of foxes is high (Trewhella et al.. 1988: Harris, 1981). Although dispersion is not determined by one single factor. it is evident. nevertheless. that the presrncc of communica-

tion passages such as river banks (Storm at al., 1976; Zimen, 1984; Harris. 1986), railway lines (Trewhella and Harris, 1990) and road networks (Storm at al., 1976: Zimen, 1984) can direct movement. Besides facilitating dispersion. riverside habitats, particularly in the peripherical areas, offers good opportunities for reproductive dens and a notable trophic resource which consists principally of micromammals (AA.VV., 1985)

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