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CAMERA TRAPPING THE EUROPEAN WILDCAT (*FELIS SILVESTRIS SILVESTRIS*) IN SICILY (SOUTHERN ITALY): PRELIMINARY RESULTS

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ABSTRACT - The wildcat is an elusive species that is threatened with extinction in many parts of its range. In Sicily it still lives in a wide range of habitats. During 2006, camera traps were used to investigate the distribution of the wildcat over a 660 ha wide area on the south-western slope of Mount Etna (NE Sicily). Twelve out of 18 trapping stations provided a total of 24 photographs. Nine different individuals were identified using morphological criteria. Our work confirms the suitability of camera trapping for monitoring elusive carnivores.

Key Words: *Felis silvestris silvestris*, distribution, density, Mount Etna, Italy

RIASSUNTO - ***Trappolamento fotografico per il monitoraggio del gatto selvatico* (Felis silvestris silvestris) *in Sicilia: risultati preliminari.*** Il gatto selvatico è una specie elusiva, minacciata di estinzione in gran parte del suo areale. In Sicilia è ancora presente in diversi habitat. Nel 2006, abbiamo utilizzato trappole fotografiche per indagare la distribuzione del gatto selvatico sul versante sud-occidentale dell'Etna. Dodici delle 18 stazioni di monitoraggio hanno fornito un totale di 24 fotografie. Nove diversi individui sono stati identificati, utilizzando criteri morfologici, in un'area di 660 ha. Il nostro lavoro ribadisce la bontà del *camera trapping* per monitorare carnivori elusivi.

Parole chiave: *Felis silvestris silvestris*, distribuzione, densità, Etna, Italia

INTRODUCTION

Sicily is characterized by the presence of one of the most important insular population of the threatened European wildcat (*Felis silvestris silvestris* Schreber, 1777*)* (Ragni, 2006; IUCN, 2009). Deforestation, habitat fragmentation, illegal hunting and hybridization with the domestic cat (*Felis silvestris catus*) are the major threats for the long term survival of this felid (Nowell and Jackson, 1996). Research on the ecological requirements of the remaining wildcat populations is essential for their management and conservation. Since the 1980s few studies have been carried out about this *taxon* on the Sicily (Ragni and Seminara, 1987). Therefore, at the beginning of 2006 a pilot study with camera traps was started in the Etna Regional Park.

Camera trapping is a relatively new, non-invasive technique that can be successfully applied to monitor rare and particularly elusive species such as felids (Karanth, 1995; Jackson *et al*., 2005). The aim of this project was to test the effectiveness of camera trapping for detecting and identifying wildcat specimens.

STUDY AREA AND METHODS

The study area was located on the south-western side of Mount Etna (north-eastern Sicily; Fig. 1), at altitudes ranging from 900 to 2000 m a.s.l. The landscape consists of quite recent large lava flows and volcanic cones of different ages intermixed with wide patches of wood (*Pinus laricio, Quercus pubescens* and *Quercus ilex).*
Human activity is limited to wood management and sheep-farming. The climate is tipically Mediterranean but in winter snow-cover can be thick and persistent.

The location of camera traps was determined on the basis of the presence of wildcat scats, identified from a preliminary and accurate exploration of the study area.
Five 35 mm camera traps (4 Deer Cam® DC-300 and 1 Deer Cam® DC-200) with passive infrared motion/heat sensors were used to monitor 18 different locations, as to cover an area of about 2000 ha (Fig. 2).
Each camera was accomodated, 40-60 cm above the ground, in an iron box closed with a padlock and tied to a tree with a chain to avoid damage and theft. Cameras were set with no time delay between successive photos.
The batteries of the sensor lasted 40-50 days, depending on the number of photographs taken, while the cameras' batteries were replaced twice a month.
In 2006 camera trapping was carried out during two different periods: from April 11 to August 8 and from September 26 to December 16. According to Jackson *et al*. (2005), during the first period the scent lure of domestic cats was used to attract the wildcats, whilst in the latter no attractants or baits were used.

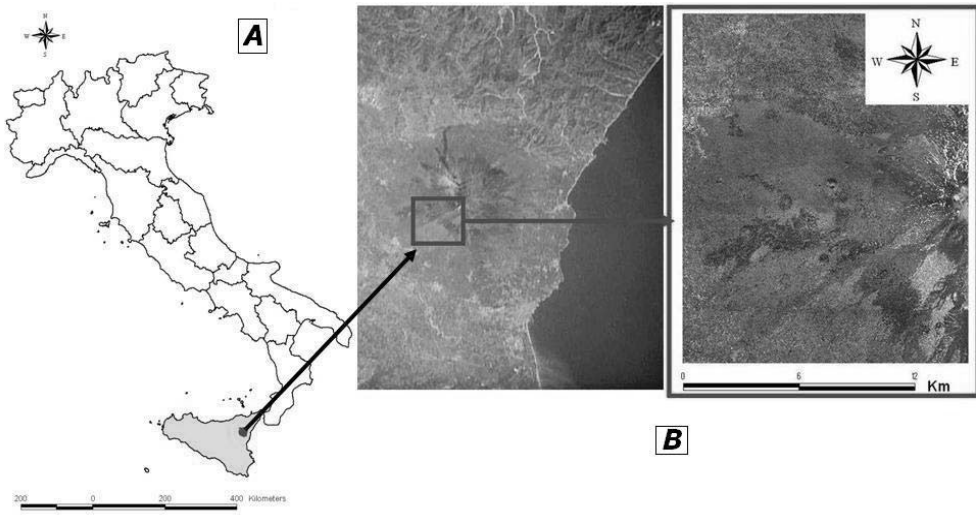

Figure 1 - Study area.

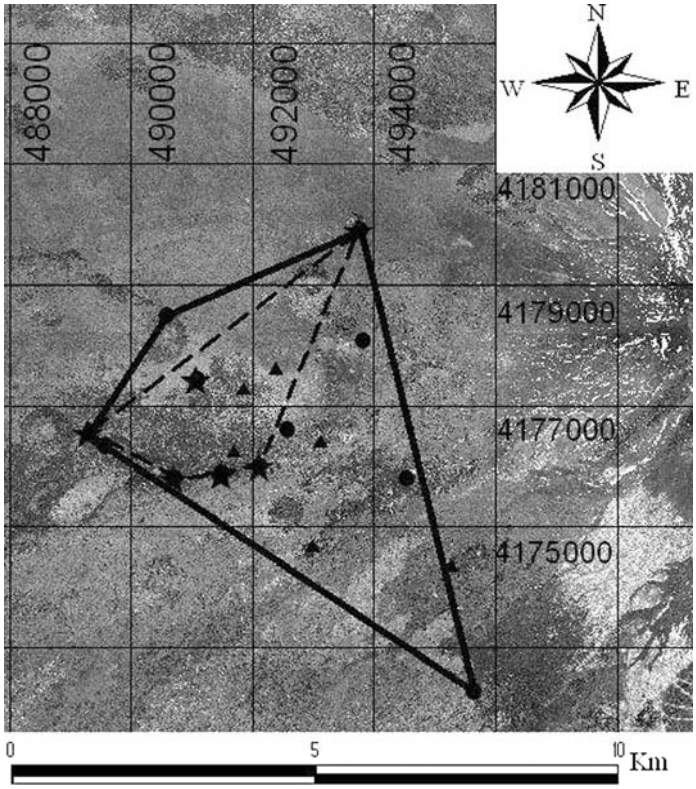

Figure 2 - Camera-trap stations (points: stations positive for wildcats; triangle*s*: stations negative for wildcats; stars: camera trap stations that provided the 9 photos in Figure 3; interrupted line polygon = ca. 660 ha; continuous line polygon = ca. 2000 ha).

The scent was extracted by catheter during veterinary routine examinations of domestic cats and analysed to check if donors were healthy. After extraction, the scent was put into small test-tubes and immediately frozen at -20° C. A small piece of cork was sprinkled with the scent lure and placed 10 cm under each camera trap. During the second period no scent lure was used to test if it was still possible to gain pictures of wildcats. Variation in the trapping success between the two periods was tested by the chi-squared (χ^2) test.

To distinguish individual wildcats, all pictures (N=14) showing the same body region (right side) were compared. The number and shape of both the stripes on the flank and the dark rings of the tail, and the shape of the whole tail were considered (Ragni and Possenti, 1996).

RESULTS

Altogether, cameras operated for 824 trap-days (518 during the first period; 306 in the second one).

Twenty-four pictures of wildcats were taken (14 and 10, respectively) at 12 of the 18 camera trap stations (Table 1).

Table 1 - U.T.M. coordinates, trapping period, number of trap-days and photos for each camera station. (*stations monitored during both periods).

	Trap station	X	Y	Start	end	trap-days	photos
First period No trap-days = 518	1	492125	4176008	14/04/06	30/05/06	46	2
	2	491708	4176252	14/04/06	30/05/06	46	0
	3	492388	4177613	19/04/06	22/06/06	63	0
	4	491873	4177284	11/04/06	30/05/06	49	0
	5	489319	4176554	30/05/06	13/07/06	43	2
	6	489569	4176316	30/05/06	20/07/06	50	1
	7	495655	4172251	30/05/06	08/08/06	68	2
	8	490597	4178500	30/05/06	04/07/06	34	1
	9	493773	4179907	22/06/06	17/07/06	25	2
	10*	493127	4176420	08/07/06	08/08/06	30	0
	11	490719	4175804	13/07/06	08/08/06	25	3
	12	493820	4178069	17/07/06	08/08/06	21	1
	13*	495271	4174348	20/07/06	08/08/06	18	0
Second period No trap-days = 306	14	492572	4176596	26/09/06	20/10/06	24	3
	15*	495271	4174348	30/09/06	16/12/06	76	0
	16	494532	4175784	26/09/06	20/10/06	24	1
	17*	493127	4176420	30/09/06	16/12/06	76	0
	18	491505	4175875	20/10/06	16/12/06	56	3
	19	491098	4177436	20/10/06	07/11/06	17	3
	20	492995	4174688	13/11/06	16/12/06	33	0

No gap was recorded for any of the camera traps during the whole period of monitoring. Wildcats were only photographed between 19:00 until 07:00; probably no diurnal pictures were taken because the exposure of the camera had been set for the night. Accordingly, 50 blank photos were taken. Although they were carefully examined, no animal could be identified. Snapshots were probably caused by vegetation being blown by the wind in front of the sensor.

A minimum of 9 different wildcats (Fig. 3) were identified (6 in the first period and 3 in the second one) in an area of some 660 ha (Fig. 2). The minimum density ranged from 0.45 ind./km^2 (considering the whole trapping area) to 1.37 ind./km^2. None of the individuals could be sexed, nor the presence of more than one individual per trap-site ascertained.

No difference in the rate of trapping success emerged between the two trapping periods (respectively, 1 photograph/37 trap-days *vs.* 1 photograph/31 trap-days; $\chi^2 = 0.02$, N.S.).

DISCUSSION

Our results confirm the presence of the wildcat in north-eastern Sicily.

Throughout their range, the density reported for European wildcats ranges from 0.1 to 0.5 individuals per km^2 (Di-

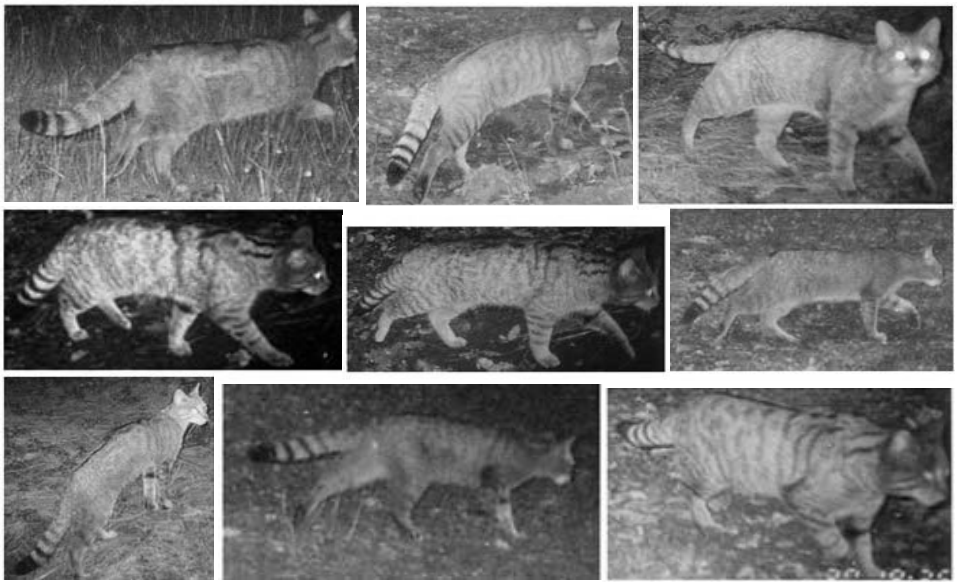

Figure 3 - The nine individuals distinguished on the basis of their external morphology.

mitrijevic, 1980; Heller, 1993; Okarma *et al.*, 2002; Ragni, 2006; Stahl and Leger., 1992; Weber *et al.*, 2008). The high wildcat density recorded for our study area is probably a consequence of the abundance and variety of prey (AA.VV., 2008) and protection ensured by the park.

Nonetheless the use of two camera-traps per site could allow more accurate estimates of population density (Jackson *et al*., 2005).

The scent lure of domestic cats is perishable, expensive and not easy to obtain. Other scents, such as *Valeriana officinalis*, have been suggested. This is a cheaper standard product and induces wildcats to scrub (Weber *et al*., 2008). In our study, however, attractants did not significantly increase trapping success. Considering that the use of a scent may increase the likelihood of differential individual responses (according to age, sex or social status), violating one of the more important assumptions underlying capture-recapture population estimation (Jackson *et al*., 2005), our results recommend the use of camera traps without any scent lure.

On the whole, camera trapping proved to be a valuable technique for monitorring this elusive species. Further studies will focus on the development of a protocol to maximize the number of pictures useful to detect individual specimens.

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