Camera-trapping as an assessment tool for mammalian fauna presence in Pindos mountain range, Greece.

Sp. Galinos[1], Al. Giannakopoulos[1], C. Godes[1], G. Iliopoulos[1], G.Mertzanis[1], Ch. Pilides [1,3], S. Riegler[1], A. Riegler[2, 1], Ath.Tragos[1], Y. Tsaknakis[1].
1, NGO Callisto, 123 Mitropoleos str., 54621 Thessaloniki, Greece
2, University of Vienna - Management of Natural and Biological-Resources Dept. – Vienna - Austria
3, University of Bristol – Environmental Sciences Dept – U.K.

Introduction

Efficient and reliable methods for rapid assessment of species richness and abundance are crucial to determine conservation priorities. Over the years, there has been a number of different assessment methods developed, like line transect census, track surveys, and camera trapping. Their efficiency mostly depends on local and environmental conditions. Camera trapping was used in combination to other methods such as track surveys and telemetry for the assessment of brown bear and wolf abundance and spatial behaviour in the study area, but also for providing the necessary information on the area's fauna (Fig.2). This information was also used for conservation practices and proposals to mitigate the barrier effect of the Egnatia highway.

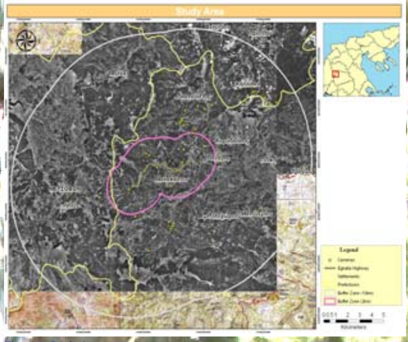


Figure 1: Study Area

Study Area

The study area (Fig.1) belongs to the prefectures of Trikala, Grevena and Ioannina, along the newly constructed Egnatia Highway, at the sections 3.5.1-3.5.2 (Metsovo Tunnel - Panagia Tunnel). It is part of the N.E mountain range of Pindos and is adjacent to the Northern Pindos National Park. Main vegetation types consist of oak, (*Quercus sp.*), European Black Pine (*Pinus nigra*) and Fir (*Abies sp.*), creating a mosaic of habitats such as mixed forests, natural grasslands, small scale agricultural lands and riparian vegetation, in altitudes ranging form 600 to 2200m. A variety of fauna species comprises brown bear (*Ursus arctos*), grey wolf (*Canis lupus*), roadeer (*Capreolus capreolus*), wild cat (Felis silvestris silvestris), otter (*Lutra lutra*), Egyptian vulture (*Neophron percnopterus*) etc, of which many are listes as priority species under EU Habitat Directive 92/43 and 79/409.


Figure 2: The automatic infrared cameras used in the study

Material and Methods

The method was used in a project for the estimation of the impact by the construction and use of Egnatia Highway on bear and wolf populations in Pindos mountain range, NW Greece. For the assessment, 10 automatic infrared RECONYX™ cameras (RapidFire Professional Series) have been used (Fig.2). These cameras apart from capturing images, can provide important data, like the time of the day or the temperature that can prove to be very important for further analysis of an area's fauna and its habits. The choice of the 41 places where the cameras were put, was made according to the rest of the data that existed, concerning the use of space by the area's fauna.

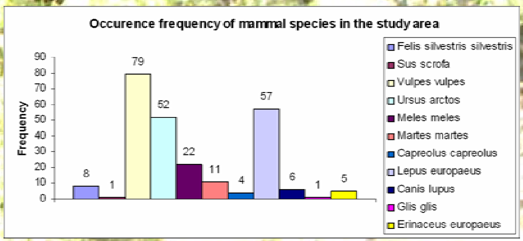

Figure 3: Image captured by the automatic infrared cameras used (*Capreolus capreolus*)

Results and Discussion

In total, we accumulated 1,358 camera days or 32,592 camera-trapping hours, thus an average of 136 days/camera.

A total of 1,458 photos of mammal taxa were taken, from 12 different mammal species (Fig.4). The most common were *Vulpes vulpes (33%)*, *Lepus europaeus* (23.9%) and *Ursus arctos (21.8%)* (Graph 1).

Apart from identifying the area's species richness, we were able to identify the abundance of species by the identification of different individuals. As an example, 24 different individual bears were identified within the surveyed sectors of the project area (Fig.5).



Graph 1: Occurrence frequency of mammal species in the study area

Figure 4: Identification of different species. A: *Felis silvestris silvestris*, B: *Vulpes vulpes*, C: *Lepus europaeus*, D: *Canis lupus*


Figure 5: Identification of different individual animals of the same species (*Ursus arctos*)

Camera trapping proves to be a very useful tool for conducting mammal surveys as they can provide sufficient data for the presence and abundance of species in an area.

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Acknowledgements
Project funded by Egnatia S.A

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