USE OF CAMERA TRAPPING FOR MONITORING WILDLIFE AND DENSITY ESTIMATION

Peška Pavel a Plhal Radim

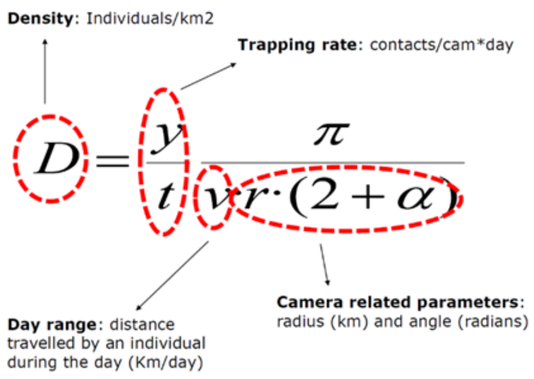
Department of Forest Botany, Dendrology and Geobiocoenology, Faculty of Forestry and Wood Technology, Mendel University in Brno
Department of Forest Protection and Wildlife Management, Faculty of Forestry and Wood Technology, Mendel University in Brno

Why to use Random Encounter model (REM)?

- Individual identification is not necesary. Lower level of stress for individuals in the study area.
- Data acquisition for the REM method is very inexpensive in terms of equipment and time.
- The method is validated and widely used, our results can be compared with those of other researchers.

INTRODUCTION

Using the REM method, it is possible to obtain an estimation of the population density of the most game species based on the detection index (y/t), which is obtained from the camera trap records. This index is subsequently used to determine the size of the daily home range - DR (for an individual or a group of animals) using the formula:



METHODOLOGY

When installing a camera trap in the field, it is necessary to follow the recommendations of the manufacturer of a particular type of camera trap so that the recording is taken under optimal and, above all, standard conditions. In front of the camera trap, 6-8 markers (marking pins) are placed in the field so that they form an arc at a distance of 2,5; 5; 7,5 and 10 m from the camera trap (Caravaggi et al. 2017). The center pin should agree with the axis of the camera trap (image) and the side pins should mark the detection angle of the camera trap and should be at a known distance from the center pin. The marked terrain in front of the camera trap should be recorded on at least one image. Then the pins can be removed and only the center pins can be left, or even these can be replaced with other less noticeable terrain markers (e.g. stones, branches...). The area marked out in this way in front of each camera trap will subsequently facilitate the analysis of individual images and the determination of the speed of movement of captured individuals (Fig. 1).

Models of camera traps with infrared (invisible) illumination are used for night photography. These camera traps are placed randomly (without bait) in the field, for example in the intersections of a square grid above the area of interest (Rowcliffe et al. 2016). For larger species of ungulates (deer, pig), the density of camera traps in the vertices of a square network with dimensions of 1.5-2 km * 1.5-2 km proved to be ideal. Motion sensitivity in all camera traps is set to medium. Camera traps are set according to the manufacturer's recommendations for optimal capture. The recording was set to a sequence of 3 images in case of capturing the movement of the animals. In order to record the trajectory of the animal's movement as accurately as possible on the images, the minimum time interval between the series of images was chosen.

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The length of exposure of the camera traps in the field depends on the purpose of the recording. For a sufficiently high-quality description of the deer and wild boar populations, a minimum duration of exposure of 1.5 months is required on average (depending on the population density). In general, it can be said that the number of at least 100 different contacts of the selected game species with the camera for each of the two movement speed categories can be considered sufficient.

On selected images (series of images), where the length of the movement path of the captured individual can be determined by image analysis, we determine and write the following variables into the database (Fig. 2):

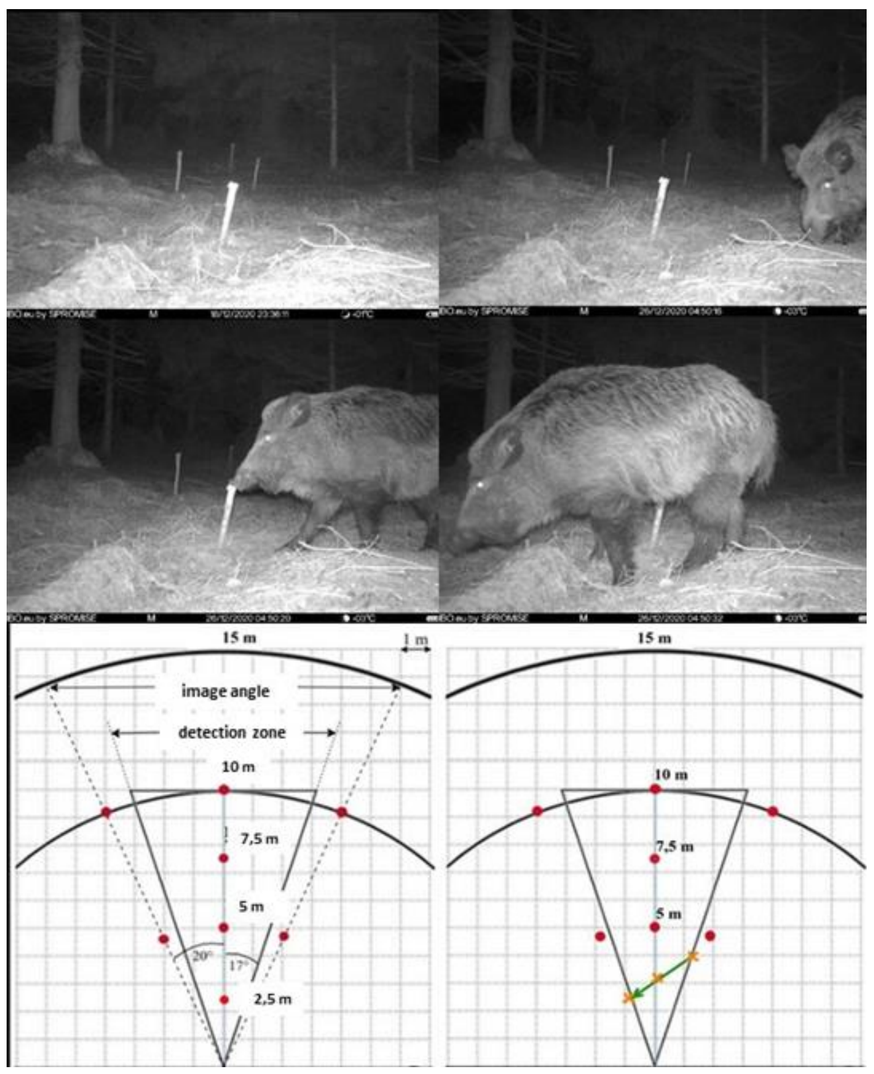

Fig. 1: The analysis of the animal movement.

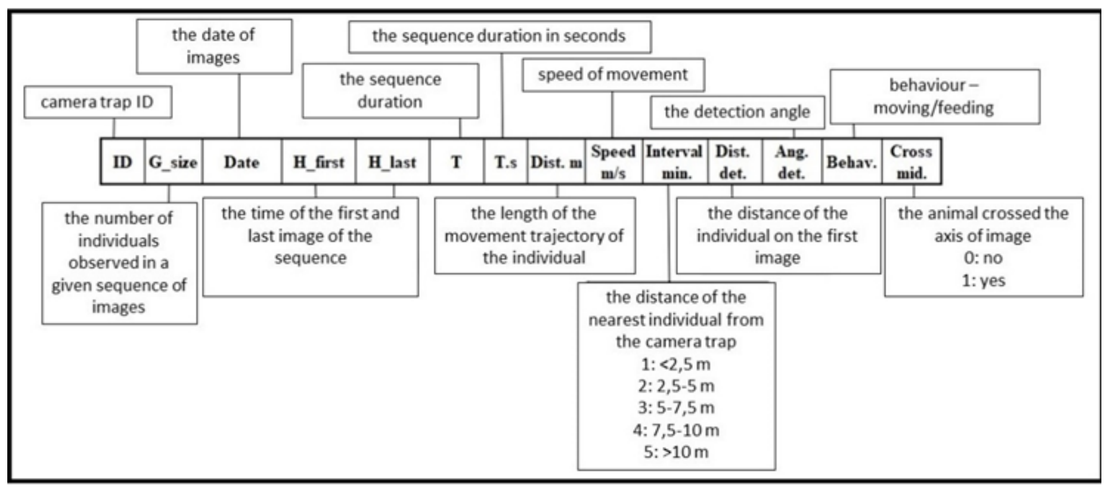

Fig. 2: The design of the database used for the image analysis

LITERATURE

Caravaggi A., Banks P.B., Burton A.C., Finlay C.M.V., Haswel P.M., Hayward M.W., Rowcliffe M.J. and Wood M.D. 2017: A review of camera trapping for conservation behaviour research. *Remote Sensing in Ecology and Conservation* 3 (3): 109-122.

Rowcliffe J.M., Jansen P.A., Kays R., Kranstauber B. and Carbone C. 2016: Wildlife speed cameras: measuring animal travel speed and day range using camera traps. *Remote Sensing in Ecology and Conservation* 2: 84–94.

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