

targets. Increasing forest cover may require a combination of reforestation efforts and a major regulation of logging and grazing activities.

A strategy for the management of forest resources requires the support of the public at large which is possible only through outreach campaigns. The employment of forest wardens may be necessary to protect the forests from logging and grazing activities. Different large carnivores species have until recently been filling that role, guarding our forests resources. Wolves, hyenas, leopards and bears especially, have been able to keep loggers and livestock herders to some extent at bay because of the fear that men had of them.

Unfortunately, men have responded to this fear by poaching bears and other carnivores; as a result they have gained greater access to forest



resources and overharvested them. Loss of forest cover and resources has in turn pushed bears to seek food in cultivated fields thus increasing the conflict with man.

Can we have our "natural forest guards" back to our service so that our future generations can find forest cover sufficient to support their life? Our forests still need them. 🐻

Greece: an Attempt to Identify Individual Brown Bears from their Footprints

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Footprint identification in mammals has often been excluded as a reliable monitoring technique because it has not been developed as

an accurate, objective and replicable method. However, recent studies were successful in identifying individuals from their footprints in species such as black (*Diceros bicornis*) and white rhino (*Ceratotherium simum*) (Jewell, Alibhai & Law 2001, 2008), snow leopard (*Uncia uncia*) (Riordan 1998) and tiger (*Panthera tigris*) (Sharma 2005).

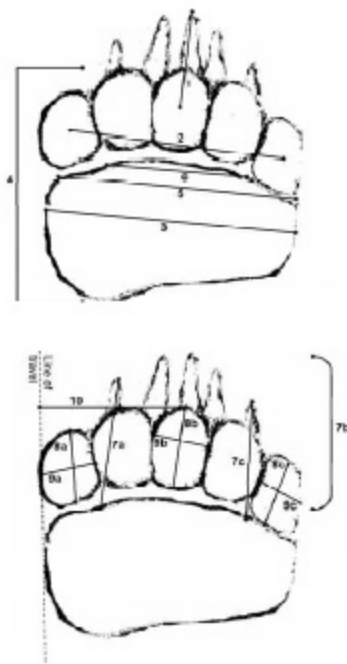
Few published works on the brown bear (*Ursus arctos*) footprint differentiation include earlier attempts on the identification of individuals as a census technique (Edwards and Green 1959, Klein 1959). More recently, Mattson (2003) has successfully investigated the relationship between the gender and age-class as indicated by the width of the front-foot footprint of brown bears.

In the framework of a M.Sc. thesis and in collaboration with the non governmental organization CALLISTO a study is being in connection with a

monitoring project for the assessment of the 37km stretch of the Egnatia highway construction impact upon brown bear population and habitats in the eastern Pindos mountain range. The objectives of this study include the development and testing of a new method for the classification-identification of individuals using footprint biometric data.



For the development of the method, successive prints made by the same bear are measured, in order to find out the variation of the dimensions in the footprints of an individual. On this basis, the 11 GPS/GSM-collared bears of the study area are being tracked. Since it is not yet known which, if any, features of the track might provide a distinctive statistical profile of a particular animal, 16 measurements are taken from each footprint, as indicated in the picture. Also, when a good set of footprints is available, the stride and the straddle of the trail are measured.



For purposes of the study, throughout the capturing procedure of the radio-collared bears, digital photographs of their foot pads were taken. Furthermore, when possible, prints from their pads were impressed on modeling clay and on paper using ink. Both approaches provided a detailed outline of the animals' footprints on acetate sheets for better identification of the known bears' tracks in the field.

At the same time, trials are conducted for the application of the FIT method. This particular method has already been successfully applied on other species by Sky K. Alibhai and Zoe C. Jewell and will be adjusted for this study. For the application of the FIT method, a number of digital images of clear footprints from known animals is needed for the development of the FIT algorithm. For this aim, pictures of the footprints of the radio-collared bears are taken in the field. Also, images will be taken from captive individuals in a controlled environment.

At the moment, after a few months in the field, some sets of measurements from some of the 11 radio-collared animals have been obtained. The autumn rainfalls are being expected for the continuation of the study in the field and in the meantime focus will be on the captive bears.

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