

UNIVERSITY OF SOUTHAMPTON

FACULTY OF ENGINEERING, SCIENCES & MATHEMATICS

School of Geography

**MAPPING CONSERVATION AREAS FOR
CARNIVORES IN THE CARPATHIAN MOUNTAINS**

by

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Thesis for the degree of Doctor of Philosophy

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UNIVERSITY OF SOUTHAMPTON**ABSTRACT**

FACULTY OF ENGINEERING, SCIENCE AND MATHEMATICS

SCHOOL OF GEOGRAPHY

Doctor of Philosophy**MAPPING CONSERVATION AREAS FOR CARNIVORES IN THE
CARPATHIAN MOUNTAINS**

By Valeria Salvatori

The present study is an effort towards the international and multidisciplinary approach to conservation of European biodiversity. The main aim was to map the distribution of suitable areas for the conservation of bears, lynx and wolves in the Carpathian Mountains. It was done applying a distance classifier, the Mahalanobis distance, over a set of environmental variables representing the region.

The results suggested that 41, 58 and 65% of the Carpathian Ecoregion is highly suitable for bear, lynx and wolf, respectively. Considering the three carnivores at once, 20% of the area is highly suitable.

Suitable areas are fragmented, but interspersed with areas of less suitability value, without being isolated, and spatially distributed all along the Mountain range.

The results were validated with an independent data set and results suggest that the model produced an acceptable estimate of the areas effectively occupied by the carnivores. The comparison between suitability maps obtained with the two independent data sets showed that they were consistent, always reaching values of K-Statistics > 0.5 .

A comparison was made using input data at three spatial resolutions (1km, 250m and 30m). The results obtained were highly dependent on the details provided by the baseline data, although the general trends were consistent. This may depend on the type of input data and the portion of subjective input in the land cover classification data. The latter aspect was further explored through the testing of whether the use of unclassified satellite images, in the form of vegetation index, could replace the land cover maps. It appeared that such a replacement may be conditional to the area considered and the amount of human activities, as well as the ecological needs of the species. In the present study, the results obtained with unclassified images were poorer than those obtained with land cover maps.

The development of human activities over the land poses problems of how to integrate land exploitation and biodiversity conservation. The outputs of the environmental modelling exercise were used for estimating the distribution of potential conflicts between the presence of carnivores and livestock husbandry practices. Results suggested an effective management would avoid the summer grazing of livestock in carnivore areas and the use of damage prevention measures. The actual effect of currently protected areas in the region was assessed and the need of an increased portion of protected land, particularly in Romania and Ukraine emerged after analysing the proportion of highly suitable areas for large carnivores under any kind of legal protection.

DECLARATION OF AUTHORSHIP

I, *Valeria Salvatori*, declare that the thesis entitled '*Mapping Conservation Areas for Carnivores in the Carpathian Mountains*' and the work presented in it are my own. I confirm that:

- this work was done wholly or mainly while in candidature for a research degree at this University;
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- where I have consulted the published work of others, this is always clearly attributed;
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