



First results from a niche-model based reconstruction of the Aurignacian culture in the Carpathian Basin

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Early Upper Paleolithic sites in the Danube catchment have been put forward as evidence that the river was an important conduit for modern humans during their initial settlement of Europe. Central to this model is the Carpathian Basin, a region covering most of the Middle Danube. Because the archeological record of this region is still poorly understood, this paper aims to provide a contextual assessment of the Carpathian Basin's geological and paleoenvironmental archives starting with the late Upper Pleistocene. Subsequently, it compiles early Upper Paleolithic data from the region to provide a synchronic appraisal of the Aurignacian archeological evidence. This paper then uses this data within a computer-based method to estimate optimal migration routes of early human population groups through the Carpathian Basin by a combination of ecological niche analyses. In the proposed method, niche probability is predicted using methods from the R *dismo* software library, a combination of ecological niche and species distribution modeling based on the maximum entropy theory. We input into the model the location of known archeological sites, topographic variables (e.g. altitude, aspect, slope) and landform classifications derived from the SRTM DEM. Furthermore, we included soil, geology (bedrock/karst), and paleoclimate data. We also present a case study of how this technique has been used for an archaeological survey. Our results suggest that the Carpathian Basin has played an important role in the dispersal of early modern humans however, more geoarcheological research is needed before a firm understanding of the region can be achieved.