108

CANTABRIAN BEAR CORRIDOR RESTORATION: COMBINING EMPIRICAL SPECIES DATA WITH CONNECTIVITY MODELS TO IMPLEMENT CONSERVATION ACTIONS

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Habitat loss and fragmentation due to land use intensification and development of transportation infrastructures, together with direct anthropogenic mortality, have led to a large decline and subdivision of many bear populations. As a result, the viability of bear populations is often largely dependent on functional connectivity through dispersal across broad landscapes. This is particularly the case for the brown bear in the Cantabrian Mountains (Northwest Spain), the last remaining native brown bears in the Iberian Peninsula. With a total population of about 200 individuals, Cantabrian brown bears occur in two small and endangered subpopulations with limited genetic flow that are separated by a 50 km-wide gap with high density of transportation infrastructures and human settlements. Though recent studies revealed a positive population trend and evidences of incipient migration and gene flow, the enhancement of effective connectivity between both subpopulations via dispersal and migration is a crucial concern for the species´ long term conservation. It is therefore critical to provide rigorous, empirically based and spatially explicit predictions of potential corridors and important connecting elements in the landscape to guide habitat conservation and restoration, and to prioritize the mitigation of potential barriers for bear dispersal. To this end, we proposed an integrated framework based on empirical species data that combines multiscale habitat modeling, landscape genetics and connectivity modeling through least-cost path analysis, circuit theory and habitat reachability metrics, as developed in the GEFOUR research project. We used the models to identify main stretches of barriers in need of mitigation actions and to select the forest habitat patches along the whole corridor area that are more important for the maintenance or enhancement of landscape connectivity for bears. We combined these results with detailed information on current forest management, livestock use and other human activities and constrains in the study area. We provide conceptual and tangible results and use them to design and implement a restoration strategy aiming to maximize landscape permeability for the bear population. Some of these restoration actions are included in a recently approved EU LIFE project.

23RD INTERNATIONAL CONFERENCE ON BEAR RESEARCH AND MANAGEMENT

"Bears and humans in the 21st century: challenges and solutions for a peaceful coexistence"

Thessaloniki, 05 – 11 October 2014

Conference Venue: Olympion Complex & Electra Palace Hotel