
Landscape genetics of a montane pond-breeding amphibian in ski resorts

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Abstract

Linear human infrastructures can act as ecological barriers for animals and limit gene flow within a landscape. If effects of roads and railways on animal movement have been widely studied, effects of infrastructures related to mountain activities like ski pistes and ski lifts are less well known. In order to quantify the ecological permeability of ski resorts, we implemented a procedure involving Bayesian clustering methods and circuit theory applied to landscape genetics, allowing to estimate resistance values of the landscape. The model species is a pond-breeding amphibian, the European common frog (*Rana temporaria*), for which we used eleven microsatellite markers. We analyze to what extent genetically different groups can coexist in ski resorts at a very small spatial scale, and test the hypothesis of isolation by distance for distances inferior to 1 km. We quantify the contribution of different variables related to topography (such as slope, wetness index, elevation) or land cover and human activity (presence of ski runs and roads, vegetation) on the genetic distances. Our results are relevant in a perspective of conservation in human-transformed mountain landscapes.

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