



## Impact of transient climate change upon Grouse population dynamics in the Italian Alps

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Understanding the effect of short to medium term weather condition, and of transient global warming upon wildlife species life history is essential to predict the demographic consequences therein, and possibly develop adaptation strategies, especially in game species, where hunting mortality may play an important role in population dynamics.

We carried out a preliminary investigation of observed impact of weather variables upon population dynamics indexes of three alpine Grouse species (i.e. Rock Ptarmigan, Lagopus Mutus, Black Grouse, Tetrao Tetrix, Rock Partridge, Alectoris Graeca), nested within central Italian Alps, based upon 15 years (1995-2009) of available censuses data, provided by the Sondrio Province authority.

We used a set of climate variables already highlighted within recent literature for carrying considerable bearing on Grouse population dynamics, including e.g. temperature at hatching time and during winter, snow cover at nesting, and precipitation during nursing period.

We then developed models of Grouses' population dynamics by explicitly driving population change according to their dependence upon the significant weather variables and population density and we evaluated objective indexes to assess the so obtained predictive power.

Eventually, we develop projection of future local climate, based upon locally derived trends, and upon projections from GCMs (A2 IPCC storyline) already validated for the area, to project forward in time (until 2100 or so) the significant climatic variables, which we then use to force population dynamics models of the target species. The projected patterns obtained through this exercise are discussed and compared against those expected under stationary climate conditions at present, and preliminary conclusions are drawn.