Testing for a relationship between climate indicators and chamois body weight in Berchtesgaden National Park (Germany)

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Abstract

Climate is changing. It is evident that climate change affects flora and fauna in various ways. Pinpointing effects tracing back to climate can be challenging as these effects oftentimes occur indirectly via downstream interactions. Mountain regions are prone to such impacts and Alpine ungulates serve as indicator species in detecting transitions at an early state. In this study I aimed at uncovering body mass trends in young Alpine chamois (Rupicapra rupicapra) between 1987 and 2013. A significant weight increase was found in individuals harvested during the first three months of the annual hunting period. These records were put in the context of selected climate variables. Spring and early summer temperature as well as early winter precipitation showed to affect body mass in kids culled in August and September, while kids culled in October and November displayed significant responses of body mass only to spring temperature. Yearlings' weight is influenced by early summer temperature and early winter precipitation. I also tested for lagging effects, which stated significance of spring and early summer temperature on body weight of kids and yearlings culled in August and September of the succeeding year. Multiple linear regression revealed little interaction among the chosen climate variables yet suggested other parameters like sex and hunting district to affect body mass. The models suggest that climatic influences are reflected differently depending on the time an individual is harvested. This fuels the discussion to what extent general changes can be perceived: Likely, the results point at displaced environmental cycles. The findings contrast with related recent studies from other parts of the Alps and provide an interesting statement with respect to Bergmann's rule. Understanding and detecting transitions is central to conservation planning and safe guarding the species future survival.

Photo: Melissa Stemmer