
CAMOUFLAGE MISMATCH IN SEASONAL COAT COLOR DUE TO DECREASED SNOW DURATION

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As a result of climate change, the duration of the ground snow cover in the temperate regions has shortened. We describe a novel and striking climate change effect on wildlife, whereby seasonal coat color becomes mismatched with background snow or lack of snow. Our objective was to quantify for snowshoe hares (*Lepus americanus*) the phenology of seasonal coat color change and potential for coat color mismatch, as first step in exploring whether hares can adapt to a decreasing snowpack. We quantified snowshoe hare molt phenology, mismatch and survival for three years at two sites in western Montana. We monitored over 450 hares weekly with radiotelemetry, quantifying the progression of the molts and snow cover. We observed considerable mismatch between hare coat color and their background during spring and fall seasons. Some level of plasticity was observed in the rate of the spring molt which mitigated the color mismatch. By contrast, onset of coat color molts remained constant. We used global circulation model downscaling at ecologically relevant scales (30m resolution) to predict changes in snowpack hares are likely to face in the future. According to our analysis annual average duration of snowpack will decrease by 29-35 days by mid-century and 40 - 69 days by the end of the century. Without evolution in coat color phenology, the reduced snow duration will increase the number of days that white hares will be mismatched on a snowless background by 3- 8 fold.