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**Winter snow cover increases swamp rabbit (*Sylvilagus aquaticus*) mortality at the northern extent of their range**

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**Abstract**

In North America, native lagomorphs that are habitat specialists are of conservation concern due to loss of habitat and fragmentation, population declines, and their importance in food webs.

Moreover, lagomorphs occupying range edges are especially vulnerable to environmental conditions given changes in climate. We evaluated the influence of snow cover on winter

mortality for 136 swamp rabbits (*Sylvilagus aquaticus*) monitored 2009-2016 in southern Illinois, USA. Winter estimates of daily mortality rates were at least five times higher ( $P=0.03$ ) on snow-covered days ( $\bar{x} = 0.033$ , SE = 0.009) than snow-free days ( $\bar{x} = 0.004$ , SE = 0.001).

Winter estimates of daily mortality rates due to predation were at least twice as high ( $P=0.08$ ) on snow-covered days ( $\bar{x} = 0.027$ , SE = 0.010) than snow-free days ( $\bar{x} = 0.003$ , SE = 0.000). Swamp rabbit mortality was higher on snow-covered days primarily via elevated levels of predation.

Snow cover might limit the availability of hiding cover and food resources for swamp rabbits, thereby increasing their movements and vulnerability to predators, especially given their pelage coloration.

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