

(23) SURPRISES REVEALED BY LONG-TERM DATA: SNOWSHOE HARE ABUNDANCE AFFECTS SURVIVAL OF DALL'S SHEEP LAMBS

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We estimated annual survival and causes of death of Dall's sheep (*Ovis dalli*) lambs in the central Alaska Range during the peak and decline of a cyclic snowshoe hare (*Lepus americanus*) population to test whether changes in abundance of hares affect Dall's sheep either negatively, by subsidizing predators (apparent competition), or positively, by diverting predation (apparent commensalism). The main predators of lambs were coyotes (*Canis latrans*) and Golden Eagles (*Aquila chrysaetos*), which rely on hares as a primary food but utilize lambs as an alternate prey. Coyotes killed 45% and eagles 34% of 65 radiocollared lambs for which cause of death was identified. Apparent survival of coyotes declined, both coyotes and eagles failed to produce offspring, and lamb survival rates more than doubled when hares were scarce, supporting the hypothesis of predator-mediated apparent competition between hares and sheep. Long-term data suggest a correlation between populations of hares and sheep extending back ≥ 30 years, including a period when coyotes were rare and eagles were presumably the main predators of lambs. Indirect interactions among multiple species of predators and prey can greatly complicate management efforts. Long-term studies are needed to increase understanding of the many interactions among species in complex communities.

14th Alaska Bird Conference

November 16-18, 2010

Anchorage, Alaska



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