Identifying drivers of bighorn sheep population recovery in the wake of pneumonia die-off events

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ABSTRACT: Bighorn sheep populations across the Intermountain West are subject to disease pressure from the respiratory pathogean *Mycoplasma ovipneumoniae*. Although the effects of *M. ovipneumoniae*-associated disease die-offs are well documented, less is known about the factors driving long-term variation in post-die-off demographic responses. While many herds experience years to decades in which recruitment is less than 20 lambs per 100 ewes, some herds' lamb survival rates are able to rebound rapidly following die-off events. The reason why these herds recover quickly while others do not is currently unknown. Here, we assess the roles environmental, demographic, and pathogen-associated factors could play in shaping bighorn sheep herd recovery. Our analysis relies on more than 30 years of data from over 40 bighorn sheep herds across the state of Nevada. Our results suggest that herd demographic responses to *M. ovipneumoniae* vary dramatically across subspecies, and that environmental factors may be more important in shaping those demographic responses in desert bighorn than in Rocky Mountain or California bighorn herds. Our results could have important implications on prioritization of bighorn sheep recovery efforts throughout the Intermountain West.

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