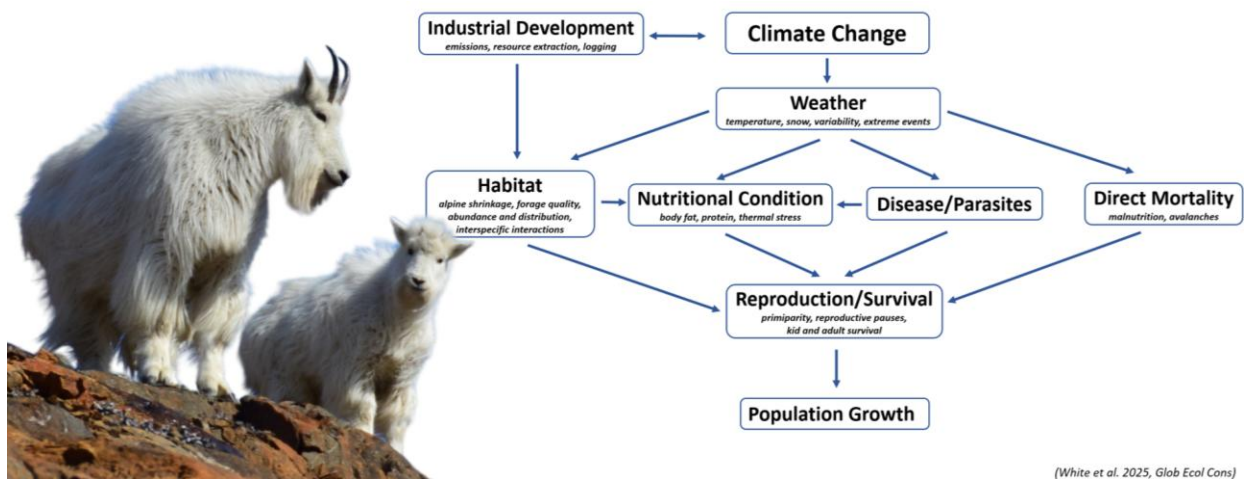


Presentation Summary and Information - Thinhorn Sheep Summit IV, May 2026

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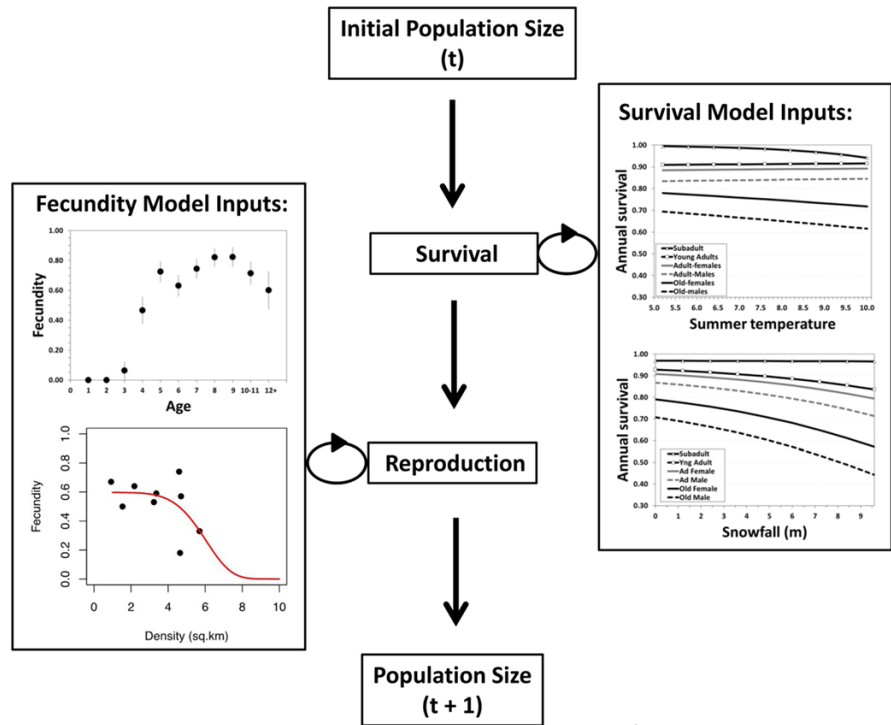
Weather and climate effects on mountain goats, with implications for North American alpine ungulates

Climate change is occurring at an accelerated rate in high-elevation alpine and mountain ecosystems. Cold-adapted, mountain species are at risk due to forecasted change and knowledge is needed to respond to current and future conservation challenges. Mountain goats (*Oreamnos americanus*) are an iconic species of North American mountain cultures and landscapes, and due to specialized adaptations for life in cold, mountainous environments they are particularly sensitive to changes in weather and climate. As sentinels of change in alpine ecosystems, the study of mountain goats offers insight into the ecological effects and conservation challenges associated with climate change in these sensitive and biodiverse environments. In a recent review paper, White et al. (2025) synthesized existing knowledge about how climate change is expected to influence environmental conditions experienced by mountain goats and associated mechanistic changes to behavior, nutritional ecology, demography, health, and interspecific interactions. In many instances, climate change effects are likely to be negative and additive to existing threats (such as human disturbance, hunting, disease, predation) though benefits are expected in some cases. Changes in climate and mountain environments will necessitate re-examination and modification of population monitoring, management, and conservation strategies. Specifically, spatiotemporal (and other) aspects of monitoring and management may need to be adjusted to accommodate emerging and novel conservation challenges. Yet, key data and knowledge gaps remain and should be addressed to advance conservation and decision-making capabilities. For mountain goats and similarly climate-sensitive alpine herbivores, effective conservation will ultimately benefit from collaborations among diverse networks guided by well-planned, strategic visions focused on common ground – namely the resiliency and persistence of culturally and ecologically significant mountain species and the alpine environment they inhabit.



(White et al. 2025, Glob Ecol Cons)

Figure 1. Schematic of relationships between climate change and other factors influencing mountain goat population ecology.



(White et al. 2018, Glob. Change Biol.)

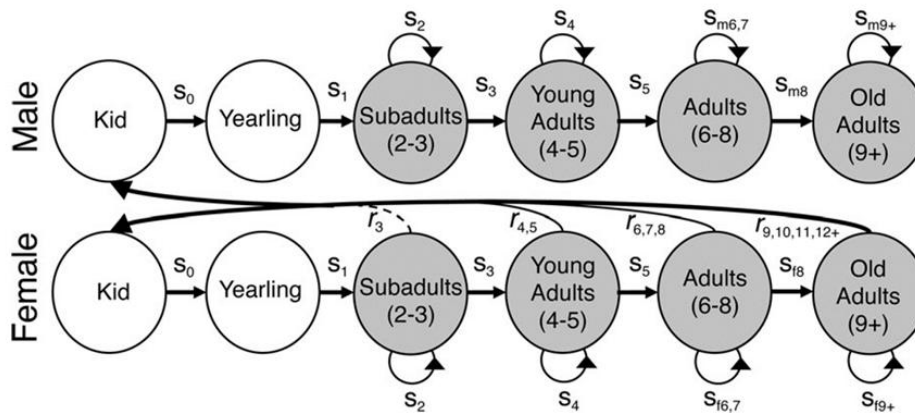


Figure 2. Projecting the future of an alpine ungulate under climate change scenarios.

Conceptual diagram describing the sex- and age-structured population modeling approach used to examine mountain goat demographic responses to GCM/RCP-based climate change scenarios (White et al. 2018). The model adjusts mountain goat survival for each sex and age class based on GCM predicted winter snowfall and summer temperature inputs for each annual time step. Mountain goat survival vs. climate relationships are based on White et al. (2011) and simulated based on the beta coefficient error distributions. Environmental stochasticity is simulated based on the statistical distributions of actual snowfall and summer temperature measurements recorded at the Juneau International Airport, Juneau, AK, USA, 1943–2014. Age-specific fecundity is modified based on density-dependent relationships. GCM, general circulation models; RCP, representative concentration pathway.

Climate NA (<https://climatena.ca/mapversion>)

Climate NA is a web-based, easy to use tool for extracting historical and future climate data for any given location in North America. The user can click on a map and summarized data for many different climate variables (temperature, precipitation, snow, etc.) can be displayed and downloaded. Historical data for years (or periods) can be accessed. For future climate projections, different General Circulation Model (GCM) and emission scenarios can be selected.

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(link to papers: <https://www.researchgate.net/profile/Kevin-White-13/research>)

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