HABITAT SELECTION, ACTIVITY AND MOVEMENT PATTERNS OF MOUNTAIN GOATS IN SOUTHEASTERN ALASKA

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Abstract: Mountain goats (*Oreamos americanus*) inhabit environments characterized by extreme topographic and climatic variability and are expected to exhibit specialized strategies designed to cope with such conditions. Within this context, demands associated with provisioning young and finding mates are likely to alter how individpers.uals respond to their environment. In this study we examined hypotheses about how mountain goat habitat selection, activity, and movement patterns varied in response to seasonal climatic conditions and reproductive constraints. In order to address our study objectives, we deployed GPS-linked radio-collars on 124 mountain goats (68 males, 56 females) in the Lynn Canal region of southeastern Alaska during 2005–2011. Mountain goat GPS location data (ca. 186,000 locations) were analyzed in a GIS framework in order to estimate daily movement rates, activity patterns (via tip-switch sensors in GPS radio-collars) and resource selection functions under different seasonal and climatic conditions for animals in different reproductive categories (i.e. males, parturient females and non-parturient females). Our findings indicated that mountain goats responded to seasonal changes in climate in distinct ways. In our coastal Alaska study site, nearly all animals conducted altitudinal migrations timed with the onset of snow accumulation and green-up; however, individual variation was evident and presumably linked to local variation in climate conditions. In addition, at a broad scale, activity and movement rates declined during winter relative to summer, yet within this framework, females and males altered behavior in predictable ways during the parturition and breeding season. Specifically, parturient females decreased movement rates during a 4-week "kidding" period, relative to non-parturient females and males. During the 5-week breeding season, or "rut", males strikingly increased movement rates and decreased activity, relative to females. Such changes in activity and movement during periods critical to reproductive success were likely driven by selection pressure exerted by predation-risk, climate, physiological constraints and social organization. Overall, these findings provided insight into behavioral strategies used by mountain goats and indicated strategies were linked to seasonal changes in climate, nutritional resources and reproductive demands.

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