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## LINKING LANDSCAPE-SCALE DIFFERENCES IN FORAGE TO UNGULATE NUTRITIONAL ECOLOGY

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Understanding how habitat and nutritional condition affect ungulate populations is necessary for informing management, particularly in areas experiencing carnivore recovery and declining ungulate population trends. Variations in forage species availability, plant phenological stage, and the abundance of forage make it challenging to understand landscape-level effects of nutrition on ungulates. We developed an integrated spatial modeling approach to estimate landscape-level elk (*Cervus elaphus*) forage quality in two adjacent study areas that differed in coarse measures of habitat quality and related the consequences of differences in forage quality to elk body condition and pregnancy rates. We found no support for differences in dry matter digestibility between plant samples or in phenological stage based on ground sampling plots in the two study areas. Forage quality, measured as digestible forage biomass, varied among land cover types and between study areas. We found that altered plant composition following fires was the biggest driver of forage quality differences, suggesting that maintaining a mosaic of fire history and distribution will likely benefit ungulate populations. Study area, lactation status and year affected fall body fat of adult female elk. Elk in the study area exposed to lower quality summer range forage had lower nutritional condition entering winter. These differences in nutritional condition resulted in differences in pregnancy rate, with average pregnancy rates of 89% for elk exposed to higher quality forage and 72% for elk exposed to lower quality forage. Summer range forage quality has the potential to limit elk pregnancy rate and calf production, and these nutritional limitations may predispose elk to be more sensitive to the effects of harvest or predation. Wildlife managers should identify ungulate populations that are nutritionally limited and recognize that these populations may be more impacted by recovering carnivores or harvest than populations inhabiting more productive summer habitats.