



Forage Response to Prescribed Fire in the Northern Rockies: Implications for Stone's Sheep and Elk

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ABSTRACT: Prescribed fire is used as a management tool to enhance ungulate habitats. Since the early 1980's, up to 7,800 ha have been intentionally burned annually for this purpose in northeastern British Columbia (BC). Yet, there have been relatively few long-term studies that have quantified the effects that fire has on plant and animal communities. Two focal grazers in northern BC, Stone's sheep (*Ovis dalli stonei*) and elk (*Cervus canadensis*), are known to benefit from fires, but the length of time that burned areas remain beneficial to these species is unknown. Previous work showed that when Stone's sheep used burned areas, it was most often younger-aged areas with higher nutritional quality, but initial increases in forage quality are believed to deteriorate over time. Elk exhibited less preference for ages of burns and may be more influenced by forage quantity. The goal of this project was to characterize the attenuation of the plant and animal (Stone's sheep and elk) responses after prescribed burns implemented in 2010 in the Besa-Prophet Area of northeastern BC. We resampled permanent transects on four burned areas and four unburned (control) sites during the year of the burn, 1 year after burning, and 7 years after burning. At each site, we monitored vegetative characteristics (forage quantity and quality) and animal use (fecal pellet counts) at different elevations (high, mid and low). We sampled in early May to capture winter forage availability and in July to index maximum summer forage availability. We also quantified the potential effects of grazing by comparing forage biomass in 8 range exclosures with paired plots outside the exclosures. In the short-term (one year after burning), both ungulate species increased their use of prescribed burned areas – likely in response to increased forage digestibility and rates of forage growth; and plant diversity returned to pre-burn levels. Our findings from this last year of the project help identify effective timing for the frequency of prescribed burning in northern BC. Our management recommendations focus on enhancing positive outcomes for Stone's sheep, while mitigating any negative effects from elk (potential competition and changes in predator-prey dynamics).

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KEYWORDS Stone sheep; *Ovis dalli stonei*; elk; *Cervus elaphus*; prescribed fire; forage; British Columbia.