

The effects of time-controlled grazing and range treatments on sage grouse habitat use and demographics in Northern Utah shrub-steppe.

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Abstract: from 1985-2005 we monitored sage grouse (*Centrocercus urophasianus*) population abundance and habitat use on the Deseret Land & Livestock ranch (DL&L) and adjacent lands in south Rich County, Utah. Males counted on leks 1993-2005 increased from 125-750 males. Management of the DL&L shrub-steppe rangelands during this period included time-controlled cattle grazing (alternating ≤ 1 month of herbivory with 12 or more months of rest) combined with range treatments (burning, planting, mechanical and chemical brush-thinning) implemented to increase herbaceous species richness and cover, reduce brush cover, or both. Approximately 1-2% of DL&L shrub-steppe rangelands were treated annually 1993-2005 (400-800 ha annually). All treatments increased herbaceous cover and abundance of desirable forbs. Arthropod biomass was positively associated with herbaceous cover. Sage grouse use (birds flushed/hour) of burns and plantings (July-September, 1996-1999) was significantly greater than in paired controls. Initial monitoring of mechanically thinned brush treatments (June-July 2005) indicates grouse are using these treatments greater than paired controls as well. Hens with broods are the predominant group observed in treated areas. Brood sizes observed in burned or planted areas averaged slightly larger than in untreated native brush stands, and significantly larger than in crested wheatgrass (*Agropyron desertorum*) plantings or nearby native brush communities under season-long grazing regimes. Although correlative, we believe the use of these habitats by hens with broods coupled with the long-term increase in breeding males suggests time-controlled grazing (mild disturbance) coupled with periodic brush-thinning (more intensive disturbance) can be used to enhance shrub-steppe landscapes for sage grouse populations.