Pattern of Herbivory, Nitrogen Content, and Biomass of Bluebunch Wheatgrass on a Mountain Sheep Habitat in Central Idaho

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ABSTRACT Bluebunch wheatgrass (*Pseudoregneria spicata* [Pursh] A. Love) is a major forage species for mountain sheep (*Ovis canadensis*) in central Idaho. Observed condition of this forage species is high, prompting an investigation of herbivory levels and subsequently nutrient content and biomass of this species. Mean amounts of tissue removed from wheatgrass plants on a slope frequently used by mountain sheep ranged from 5.3% to 26.8% from 1992-1996. Nitrogen levels ranged from 0.7-1.4% from 1998-2007 in plants collected in late June after seed-set. Higher levels of N occurred in growth following wildfire burns. Above-ground growth of bluebunch wheatgrass ranged from 11.3 to 102.1 gm/m2 and was highly correlated with spring precipitation. While herbivory on this major forage species was low to moderate, nitrogen levels may vary enough to affect mountain sheep population trends without appreciably affecting productivity of their major forage species.

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Annual Changes in Bluebunch Wheatgrass Biomass and Nutrients Related to Climate and Wildfire

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ABSTRACT Current year's growth (biomass) and nutrient levels of bluebunch wheatgrass (*Pseudoroegneria spicata*), a highly palatable bunchgrass in western North America, were evaluated over 20-year and 10-year periods, respectively. Three study sites representing a range of variation in conditions were located on south-facing slopes. Annual biomass ranged from 5.6 to 109.0 gm m-2 on individual sites with means for all sites of 42.7 gm m-2 (range 17.5–73.3 gm m-2), with April and May precipitation best predicting the variation. Variation was highest on the site lowest in elevation and highest in biomass. A fire in August 2000 that burned all study sites suppressed biomass for the following two years, aided by lower than average precipitation. The highest elevation site had higher mean values of Cu, Mg, N, K, P, S, and Zn than the two lower sites, but the greatest range of values occurred on one of the two lower sites for Ca, Fe, K, Mg, N, P, and S. Combinations of temperature and precipitation predicted Ca, K, N, P, and Zn values, while Cu and Fe were predicted with total monthly precipitation, and Mg and S were predicted with mean monthly temperature. Values of Cu, Fe, K, N, P, S, and Zn were higher than expected for one to two years following the 2000 fire, while Ca and Mg did not show any responses to the fire. Predictions for biomass and nutrient content apply to the range of conditions, temperatures and precipitation observed over the study period. The predictions may be useful in assessing responses to changes in climate, and are helpful in explaining variation in herbivore populations relative to changes in forage quality and quantity.

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KEY WORDS biomass, climate, fire, nutrients, *Pseudoroegneria spicata*

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Production and Nutrient Content of Two Shrub Species Related to Fire in Central Idaho

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ABSTRACT Nutrient content and weight of current year's growth of *Cercocarpus ledifolius* Nuttall and *Physocarpus malvaceus* (Greene) Kuntze in central Idaho were obtained during early July in the years 1987–2007. The purpose of this work was to determine whether there was significant variation between years and whether mean monthly temperatures and total monthly precipitation could predict the variation. A wildfire in August 2000 caused *P. malvaceus* to vigorously resprout. Significant differences between years occurred for all nutrients for both species. October temperatures best predicted weight of current year's growth in *C. ledifolius*, whereas prediction equations for nutrients involved spring temperatures and precipitation, primarily for June. January mean temperature and December precipitation best predicted weight of current year's growth, and spring mean monthly temperatures best predicted nutrient levels in *P. malvaceus.* Future changes in production and nutrient content of these species that are not predicted may be related to climate change.

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