

2002 Reclamation and management of crested wheatgrass invaded sites in southern Alberta

Most of North America's northern Great Plains have been cultivated for crop production, leaving remnants of natural mixed-grass prairie fragmented and threatened by alien plant invasions. The region's most widespread alien perennial forage crop, crested wheatgrass (*Agropyron cristatum sensu amplo*), has invaded native grassland and raised concerns regarding its ecological impact. To evaluate impacts at multiple scales of organization, adjacent invaded and uninvaded mixed-grass prairie were sampled at eight widely separated locations. At the population level, native C3 mid-grasses and forbs were less abundant in invaded grasslands, while native C3 and C4 short-grass abundance was not different. At community and landscape levels, diversity was lower in invaded grasslands largely because of lower forb species richness and cover, and crested wheatgrass dominance of both cover (14% basal cover) and seed-bank (404 seeds m²). At the ecosystem level, both vegetation and litter biomass were greater in invaded grasslands, however, below ground organic matter (roots and litter), soil organic carbon, total nitrogen and

phosphorus were not different. Crested wheatgrass invasion of mixed-grass prairie was associated with lower diversity within and among plant communities, and appears to simplify the composition of mixed-grass prairie landscapes. Hypotheses for crested wheatgrass dominance and persistence following invasion are suggested.